SOME ORGANIZATIONAL AND FUNCTIONAL ASPECTS OF THE FLORIDA WATERMELON INDUSTRY

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CHAPTER I

INTRODUCTION

During each of the past ten years Florida farmers shipped, on the average, 23,614 carlot equivalents[1] of watermelons.[2] This represented approximately 22 percent of the total United States volume for this period.[3] Shipments from the state varied from 16,082 carlot equivalents in 1951 to 26,886 in 1956. During this same period the average shipping-point price varied from 1.00 cent per pound in 1958 to 2.35 cents per pound in 1959.[4]

Watermelons from Florida are the major factor in the market from the middle of April until the last week of June.

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[1]Conversion factor for carlot equivalent equals 28,000 pounds.

[2]Annual Agricultural Statistical Summary, 1959-60 Season (Jacksonville, Florida: Florida State Marketing Bureau, November, 1960), p. 96.

[3]Agricultural Statistics (Washington, D. C.: Department of Agriculture, U.S. Government Printing Office, 1950-60).

[4]Annual Agricultural Statistical Summary, 1959-60 Season, op. cit.

This seasonal pattern and a comparison with competing sources is given in Table 1. From the third week in April until the middle of June the weekly supply from Florida accounts for more than two-thirds of the total national market volume. Until the last of May, Mexico is the major source of competition. California begins shipping in volume at that time. Texas, Arizona, and Georgia become important sources of supply early in June. Georgia is the largest shipper the first week in July. South Carolina is an important shipper also during the first two weeks of July. As Georgia and South Carolina reach volume production, the Florida supply decreases rapidly.

Watermelon production is widespread over the state with important production areas reaching from Collier County in the south to Holmes and Washington Counties in West Florida. In 1960, 47 counties had some commercial production (Fig. 1). The difference in climate between the production areas in the southern and western areas of the state permits a staggering of harvest dates. Harvesting in Collier County begins in late March or early April. As the season progresses the areas to the north come into production. Harvest in the central area usually follows South Florida by about a month. The Newberry-Trenton section comes into pro-

TABLE 1.--Watermelon shipments from Florida and competing areas by weeks, 1951-60[a]

Week Ending[b]	Origin				
	Florida	California	Texas[c]	Arizona	Georgia[c]
April 9	16	. .	. .	. .	. .
16	29	. .	. .	. .	. .
23	90	. .	. .	. .	. .
30	261	. .	. .	. .	. .
May 7	490	. .	. .	. .	. .
14	921	. .	. .	. .	. .
21	1,179	10	5	. .	. .
28	2,086	58	15	. .	. .
June 4	2,899	131	24	19	2
11	3,215	218	133	80	135
18	4,051	325	222	193	476
25	3,960	320	373	378	1,316
July 2	2,433	316	608	502	1,935
9	711	278	939	383	1,573
16	293	282	1,008	375	773
Total	22,634	1,938	3,327	1,930	6,210

[a]Sources: Donald L. Brooke, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Mimeo Reports 58-4, 59-3, 60-3, and 61-3, 1957-60), C. V. Noble, Marvin A. Brooker and Donald L. Brooke, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Series Nos. 54-4, 55-2, 56-1, and 57-2, 1953-56), and C. V. Noble and Marvin A. Brooker, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Series No. 52-8, 1951-52).

TABLE 1.--Extension

South Carolina[c]	Other States[c]	Imports	Total	Percent That Fla. Shipments Are of Total
. .	. .	17	33	48
. .	. .	30	59	49
. .	. .	35	125	72
. .	. .	75	336	78
. .	. .	88	578	85
. .	. .	104	1,025	90
. .	. .	116	1,310	90
. .	. .	107	2,266	92
. .	. .	83	3,158	92
. .	3	36	3,820	84
. .	21	18	5,306	76
40	22	. .	6,409	62
409	76	. .	6,279	39
1,255	39	. .	5,178	14
1,160	54	. .	3,945	7
2,864	215	709	39,827	57

[b]Based on 1960 calendar.

[c]No truck shipments were given for these sources. It was assumed that their truck shipments were in the same proportion to their total as were Florida's. Adjustments for total shipments were made accordingly.

Fig. 1.--Watermelon production areas and percentage production in various counties was of total production, Florida, 1960.

Source: Annual Agricultural Statistical Summary, 1959-60 Season (Jacksonville, Florida: Florida State Marketing Bureau, November, 1960), pp. 102-110.

duction about the first week in June. The panhandle section follows by about two weeks (Table 2).

TABLE 2.--Monthly shipments of watermelons by production areas, average per season, Florida, 1956-60[a]

Month	South Florida	Central Florida	North Florida		Total
			East of Suwannee	West of Suwannee	
Total Carlot Equivalents:					
March	54	1	. .	. .	55
April	415	9	1	. .	425
May	2,716	1,851	326	3	4,896
June	1,224	4,253	7,603	1,387	14,467
July	10	218	1,102	1,825	3,155
Total	4,419	6,332	9,032	3,215	22,998
Percent of Total Shipments:					
March	1	b	. .	. .	b
April	10	b	b	. .	2
May	61	29	4	b	21
June	28	67	84	43	63
July	b	4	12	57	14
Total	100	100	100	100	100

[a]Source: Florida Vegetable Crops Annual Statistical Summary (Orlando, Florida: Florida Crop and Livestock Reporting Service, 1956-60).

[b]Less than one-half of 1 percent.

Before the widespread use of the Charleston Grey variety, if there were no abnormal weather conditions, staggering of harvest dates permitted an orderly flow of watermelons to market. The major areas to the south were going out of production as those farther north were coming in. There was a minimum of overlapping in harvesting dates since the peak harvest in each area lasted only about ten days to two weeks. The Charleston Grey watermelon, which accounts for about 90 percent of present plantings, often results in considerable overlapping in harvesting from one area to another. Growers complained that its higher yield and longer period of harvest have frequently caused excessive supplies in the market.

The Problem

There are a number of specific characteristics that have an effect on the market for Florida watermelons. Their production is seasonal. They must be marketed in fresh form within a few days after maturity. They are highly perishable from the standpoint of desirable grade characteristics. A large segment of the industry is disorganized, with only a few growers having any type of marketing organization. Most go their individual ways when selling watermelons; conse-

quently, their bargaining power is insignificant. On the buying side, the itinerant truckers also act in a highly individualistic manner. The established handlers and chain store buyers appear to give some stability and semblance of order to the market. Many of the larger growers have working agreements with either a large cash buyer, a broker, or a chain store buyer to handle their season's crop for the going price at the time of sale.

The opinion is widespread among growers that chain store buyers set the price for watermelons. Another common complaint is that the itinerant truckers shop around from grower to grower and are influential in reducing the price. The producers see the watermelon market as a situation in which they are at the mercy of the buyers. They are unable to influence the price and must take what is offered for their crop. Many growers reflect this attitude by producing their crops and waiting for buyers to come to them. From 1956 through 1960 an average of 9 percent of each crop of Florida watermelons was abandoned because of low prices or lack of buyers.[5] Since growers have been ineffective in attaining orderly marketing while operating independently, it appears that some type of group action would be desirable.

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[5] Ibid.

Purpose of Study

The purpose of this study was to lay the foundation and make some recommendations for improving the Florida watermelon market. The three specific objectives were as follows: (1) to determine the organization of the watermelon market in order to have a basis for evaluating any program that might be suggested for improvement, (2) to determine and evaluate factors affecting the grower price of watermelons, and (3) to evaluate the effect on grower returns of various marketing programs and practices.

Review of Literature

There has been very little research dealing directly with marketing Florida watermelons. Brooke compiled statistics on production, shipments and prices for use in connection with a hearing to determine the desirability of a Federal marketing agreement for watermelons.[6]

Scott described marketing practices as they existed in Florida in 1928:

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[6]Donald L. Brooke, Statistics on Production, Shipments and Prices of Florida Watermelons with Supplemental Data for Georgia and South Carolina (Gainesville, Florida: Florida Agricultural Experiment Station Agricultural Economics Mimeo Report 57-1, 1956).

> The Florida watermelon is marketed by several different routes. In many cases the melons are sold f.o.b. the railroad track to local buyers who are generally on hand for that purpose. There are also local melon growers' associations to handle the marketing of the crop, while a few growers prefer to consign their shipments to brokers at the central markets. Still other growers follow the practice of raising watermelons under contract with the contractor furnishing the seed and fertilizer, the farmer supplying the land and labor and being guaranteed so much per carload, f.o.b. the track.[7]

Ferrier found watermelon marketing conditions existing in South Carolina in 1950 which are similar, in some respects, to the current Florida situation. Some of his observations were:

> Trucker buyers are becoming an increasingly important outlet . . . . Truck shipments reach central markets more quickly and in some cases provide a more direct route from the growers' field to the retail outlet. Independent truckers present a problem in that their destination may not be known, even to themselves, and their unannounced arrival at some markets may produce a demoralizing effect.
>
> Various problems in marketing watermelons stem from uncertainties in demand, and from the fact that they are highly perishable, they are shipped in bulk and the producing and consuming areas are often far apart.
>
> . . . . . .
>
> The results of this study indicate that the production and carefully packing of highly desirable

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[7]John M. Scott, Watermelons in Florida (Tallahassee, Florida: State of Florida Department of Agriculture Bulletin No. 10, 1929), p. 15.

> melons is the principal recommendation to be made for increasing income from commercial watermelon production.[8]

Suits developed an econometric model of the watermelon market.[9] In the model he presented an empirically determined supply and demand structure. He concluded that whatever the extent to which cantaloups and watermelons are substitutes, the effect is so small relative to the influence of other factors that it cannot be measured in a rough model.

In a study of demand characteristics of watermelons, Fowler and Klein concluded that:

> For the United States at large, the major factors affecting year to year changes in prices received by farmers for watermelons are total production, total disposable national income, and summer temperature. The net effect of a 1 percent change in production is a change in price in the opposite direction about 1.1 percent; a 1 percent change in the income index, after the influence of other explanatory variables in the analysis is removed, results in a change in price in the same direction 1.1 percent. A 1 percent change in the index of summer temperature results in a change in price in the same direction about 3.9 percent, after removing the influence of the other variables in the analysis.

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[8]W. T. Ferrier, Marketing South Carolina Watermelons (Clemson, South Carolina: South Carolina Agricultural Experiment Station Bulletin 396, 1951), p. 2.

[9]Daniel B. Suits, "An Econometric Model of the Watermelon Market," Journal of Farm Economics, Vol. XXXVII (May, 1955), p. 237.

> With no change in the other factors included in the analysis, the net price-quantity relation for watermelons nationally would shift downward at an average rate of about 4 percent per year. That is, even if there were no changes in income, production or temperature from one year to the next, price would decrease about 4 percent per year.[10]

Seale and Allen used regression techniques to derive demand functions for watermelons for 22 individual consuming centers.[11] The dependent variable was wholesale price and independent variables were volumes of watermelons and population. The regression coefficients associated with quantity and population were both highly significant. The coefficient associated with quantity indicated that a 1 percent increase in quantity would cause a decline in price of .28 percent. The coefficient associated with population indicated that a 1 percent increase in population would result in an increase in price of .23 percent.

Seale and Allen concluded also that a change from actual to optimum distribution of watermelons for each produc-

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[10]Mark L. Fowler and George L. Klein, Some Economic Factors Affecting the Oklahoma Watermelon Industry (Oklahoma State University Experiment Station Processed Series P-312, 1959), p. 41.

[11]A. D. Seale, Jr., and M. B. Allen, Reactive Programming of Supply and Demand for Watermelons Produced in Mississippi and Competing Areas (State College, Mississippi: Mississippi Agricultural Experiment Station Agricultural Economics Technical Publication No. 1, 1959).

ing area when in competition with each other would increase the net returns to all producing areas about 8 percent. In some producing areas net returns would increase; in others they would decrease.

The watermelon market in Texas, as seen by Clark and Branson, apparently is quite similar to the situation in Florida. Some examples of their observations:

> Producers for two reasons generally prefer to sell to truckers rather than to rail shippers. First, truckers seldom request inspection. Producers assume, correctly or incorrectly, that truckers' grading is more lenient. Second, most producers prefer to sell their melons in the field. Producers listed their reasons for wanting to sell in the field as convenience, better grade, better price and less expense.
>
> . . . . . .
>
> Some producers stack melons under a shade tree by the side of a highway to attract attention. Sales are made direct to consumers or truckers. If a trucker needs more melons, he is taken directly to the field.
>
> . . . . . .
>
> The truckers interviewed sold to a wide variety of market outlets. These include retail stores, chain stores, jobbers, wholesalers, brokers, cafes, restaurants, slicing stands, fruit stands, ice houses and peddlers. Some had regular customers. Others depended on selling wherever they could find a buyer.
>
> . . . . . .
>
> Lack of market information is perhaps the biggest marketing problem in the area. Growers are

frequently at a disadvantage with respect to knowing current marketing conditions.[12]

Definitions

Watermelon Growers

Watermelon growers were those persons who were directly involved in a proprietary capacity in the business of producing watermelons either as a partner or sole owner. This excluded those who financed production but were not directly involved in the cultural and management responsibilities.

Itinerant Truckers

Itinerant truckers were those persons who both bought and hauled watermelons. They could have bought for themselves or for someone else. The important point was that they negotiated the purchases and handled the payments. They may be contrasted with other truckers who were not involved at all in buying and selling but hauled watermelons for freight only.

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[12]Wayne W. Clark and Robert E. Branson, Marketing East Texas Fruits and Vegetables (College Station, Texas: Texas Agricultural Experiment Station MP-378, 1959), pp. 19-21.

Watermelon Handlers

Watermelon handlers were those individuals or organizations, other than itinerant truckers, who operated as either buyers, brokers, or shippers of watermelons. In most cases they performed in a combined capacity. They were located at the shipping point and did not do any retailing--this eliminated chain store buyers. Their size of operations in Florida varied from about 50 carlot equivalents per season to nearly 2,000.

Shipping Records

Shipping records were the records kept in the files of watermelon handlers. These included all the information pertinent to individual shipments.

Published Data

Published data included data from published sources as well as information from mimeographed reports of the Federal-State Market News Service.

Method of Procedure

Specific data were required to accomplish the objectives of this study. Information from primary sources was needed to determine the organization of the watermelon market.

This was obtained from watermelon growers, itinerant truckers, and watermelon handlers by personal interviews. Additional information was obtained by examining shipping invoices of watermelon handlers.

A different type of information was required to determine and evaluate the factors affecting the price of watermelons. Shipping invoices and published reports were the sources for these data.

Data Source and Analysis

Market Organization

To determine the organization of the watermelon market it was necessary to obtain certain data concerning the activities of those in the business. This information was collected and analyzed to ascertain the roles of the various types of operators in the watermelon industry.

Watermelon Growers

For the purpose of obtaining data from growers, the state was divided into three broad production areas (Fig. 1) with seasonality of production and type of growers the principal factors considered. The South Florida area is located south of Polk County; the Central Florida area is north of the Polk-Hardee County line and south of Marion

County. The North Florida area includes all of Florida north and west of the Sumter-Marion County line. Table 2 gives the 1956-60 average shipments from production areas by months. Although there was considerable overlapping from one area to another the pattern of production showed a steady increase in shipments for the more northerly areas as the season progressed. Concurrently, the shipments from the more southerly areas decreased.

As complete a list of growers as possible was obtained from each county having 500 or more acres of watermelons planted for the 1960 season. From this list a random sample, stratified by production areas, was taken. The number of growers selected for each area was proportional to the acres of watermelons in that area.[13] Nineteen growers were interviewed in South Florida; 24 in Central Florida and 77 in North Florida. The grower survey was made after the 1960 watermelon season in order to obtain information about that season's operations. Also obtained were the growers' attitudes and opinions concerning the watermelon market.

Data concerning growers' characteristics, marketing practices and attitudes and opinions were analyzed by tabular

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[13]County watermelon acreages were obtained from L. T. Pendarvis, County Acreages, Varieties and Harvest Date, Florida Watermelons, 1960. Mimeo Sheet, May 13, 1960.

method. Comparisons were made by size of growers for some data and by production areas for other data. Some opinions and attitudes were tabulated for all growers with no differentiation as to size or production area.

Itinerant Truckers

Schedules were taken by the personal interview method from 91 itinerant truckers. Information was obtained about their method of operation as well as their opinions and attitudes concerning watermelon marketing. Since there was no list of itinerant truckers available, a probability sample could not be taken. However, an effort was made to obtain as representative a selection as possible. Some schedules were taken from each of the major production areas of the state at the time of loading. The time covered was from May 17 until June 29, 1960. Even though a probability sample was not taken, it was felt that by spreading the interviews over the state and over approximately six weeks of time, those selected could be expected to be reasonably representative of the population.

In an attempt to determine the volume of watermelons handled by itinerant truckers, the truck-passing reports of the Florida Department of Agriculture's road guard stations were examined. No exact figure on itinerant truck volume

could be obtained in this manner, but an estimate was made by selecting the loads that appeared to be in the category of itinerant truckers.[14]

Itinerant truckers' data were analyzed by tabular method. Comparisons by time period were made for some. However, most of the information obtained from truckers was analyzed by tabular summarizations.

Since no probability sample was taken the data obtained from truckers could not be expanded into totals for the population. It is assumed that these 91 truckers constitute a reasonable representation of the entire population.

Watermelon Handlers

Since a list of handlers was not available, a probability sample could not be taken. An effort was made to get as representative a group of handlers as possible by interviewing all who could be located over a two-week period during the North Florida shipping season. This time was

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[14]Whether shipments were of itinerant truckers was decided on the basis of the weight of evidence when the following characteristics were considered. Each of the following is favorable to an itinerant trucker's load: (a) The load was 25,000 pounds or less, (b) the truck tag was of the same state as the state of destination, (c) the bill of lading owner's address was the same as the load's destination, (d) address of owner of the watermelons was the same state as truck license, and (e) the bill of lading owner was an individual.

chosen for this part of the study to enable respondents to give as complete an account as possible of their 1960 season's operations. It is the general practice among watermelon handlers to begin their operations with the start of the shipping season in South Florida and move north as the season progresses; therefore, the handlers operating in North Florida at the time schedules were obtained were, in general, those who had been present in Central and South Florida earlier in the season.

A schedule of general information about marketing practices and opinions and attitudes concerning watermelon marketing was obtained by personal interview from each of 28 handlers. This material was analyzed by tabular method. Comparisons were made by size of handler for much of the data. Information that was not suitable for comparison analysis was analyzed by summarization.

No probability sample of handlers was taken; therefore, the results obtained from the handlers could not be expanded into totals for the entire population. It is assumed that the 28 handlers interviewed presented a reasonable representation of the entire industry.

Handlers' Shipping Records

On the basis of information contained in the 28 handler schedules, four handlers were selected on a judgment basis for the purpose of securing detailed data from their shipping records. An effort was made to select those who were representative of the various types of operators. Handlers who operated as brokers, buyers, and shippers of their own watermelons were included. These handlers operated in varying combinations of the above types of operation. Large, small, and medium-size handlers were included. A one-fourth systematic sample, with a random start, was used in selecting individual records.

Data obtained from the handlers' sales invoices were analyzed by the tabular method showing comparisons by types of buyers for types of sales, types of transportation used and the proportion of sales that were inspected. Comparisons were made on the basis of shipping-point price for types of buyers and types of sales. The pattern of handlers' shipments was determined by summarizing the shipments by states of destination.

Published Data

For the purpose of determining the effect of certain factors on the farm price of watermelons, data were compiled

on a weekly basis for the 1960 season from published sources on volume of Florida watermelon shipments, terminal market supplies of all watermelons, average high temperatures for 13 northern market centers during the Florida season, and shipping-point price of Florida watermelons. These data were used to determine the regression coefficients of the variable factors on the farm price of watermelons.

Data were collected on a yearly basis from 1951 through 1960 on Florida supply, other supplies during the Florida season, average daily high temperatures for May and June for 14 market centers, disposable personal income for the United States for the second quarter of each year, and the average seasonal shipping-point prices of Florida watermelons. These data were used in the price analysis to determine the regression coefficients of the various factors on price of watermelons on an annual basis.

Shipping-point prices were changed to an on-the-vine price by subtracting one-half cent per pound.[15] This price

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[15]One-half cent a pound is generally accepted by the growers as the cost of harvesting and selling. This figure compares favorably with the harvesting and marketing costs given in D. L. Brooke, Costs and Returns from Vegetable Crops in Florida Season 1956-57 with Comparative Data (Gainesville, Florida: Florida Agricultural Experiment Station, Agricultural Economics Mimeo Report 58-8, Vol. XII, 1958), p. 58.

was used because it was considered the most appropriate for guiding growers' selling activities. Florida supply and other supplies were obtained on a per capita basis. Both disposable personal income for the United States and seasonal prices of Florida watermelons were adjusted for variations in the general price level. Disposable personal income was also tabulated on a per capita basis.

The least squares method of analysis was used. Regression coefficients of the various independent variables on the farm price of watermelons were determined for both sets of data.

Use of Analysis Results

The market organization for Florida watermelons is a framework over which any watermelon marketing program must be superimposed. The price analysis gives some indication as to what the effect on price would be if some of the factors affecting price were manipulated. Thus the results of the market organization study and the price analysis were used as a basis for evaluating alternative marketing programs.

CHAPTER II

CHARACTERISTICS, MARKETING ACTIVITIES, AND OPINIONS OF DIFFERENT SEGMENTS OF THE WATERMELON INDUSTRY

Characteristics of Growers

It would be very difficult to give a picture of the typical Florida watermelon grower since there is such wide variation in characteristics from one individual to another. In addition to individual differences there appear to be area differences. The number of acres of watermelons grown per farmer in 1960 was 61 for the state. The acreage varied from 47 in North Florida to 84 in South Florida with an average of 70 acres per farmer for Central Florida (Table 3).

TABLE 3.--Acres of watermelons per grower, years produced watermelons, and percentage of crops sold, by production areas, Florida, 1960

Production Area	Acres per Grower	Years Produced Watermelons	Percent of Crop Sold
North Florida	47	16	68
Central Florida	70	16	52
South Florida	84	6	85
All Florida	61	14	67

While area differences appear great, individual differences were much greater. The range in acres of watermelons per farmer in the sample was from five for the smallest grower to 600 acres for the largest.

There was also a wide difference in the number of years that individual growers had produced watermelons. Some planted watermelons for the first time in 1960, while one grower stated he had grown watermelons for more than 45 years. The average number of years, six, that South Florida growers had produced watermelons varied considerably from Central Florida at 16 and North Florida, 16. At least 10 of the 19 South Florida growers interviewed were local residents before watermelon production became an important activity in the area.

Economic Abandonment

One of the more serious problems confronting growers during the 1960 harvest season was a price so low that many good quality watermelons were abandoned in the field because it was not sufficient to pay for harvesting and loading. Economic abandonment was most serious in Central Florida, where growers estimated they sold, on the average, only 52 percent of their crops. North Florida growers sold 68 percent

and South Florida growers 85 percent of their crops (Table 3).

The 1960 Florida season was not normal in respect to time of harvest in various areas. Cold weather during the early growing period caused extensive plant damage in all major producing areas. Subsequent replantings at nearly the same date in various areas resulted in extensive overlapping of the watermelon harvest. This occurred all the way from Collier County in South Florida into South Georgia. This overlapping explains to a high degree the different rates of abandonment in the various producing areas. The harvest in South Florida was substantially through before there was volume production from the areas farther north. Some late crops in South Florida were abandoned because of low price while others were abandoned due to wet fields.

Central Florida, which suffered most from economic abandonment, was squeezed between South and North Florida crops. As a production area farther north came into volume harvest it tended to put the older harvesting areas out of business. There were two reasons for this. First, earlier cuttings were usually of better quality than later cuttings from the same field, thus most buyers preferred watermelons coming from the new fields. Second, as the season progressed

northward, the harvest was closer to the major terminal markets. Consequently, freight costs were lower and buyers could afford to pay more for melons which were closer to market. In 1960 the North Florida area came into volume production long before Central Florida watermelons were through, thus the high rate of abandonment in Central Florida.

The North Florida watermelon harvest was squeezed between the Central Florida area and South Georgia. Although the South Georgia watermelon harvest period overlapped that of North Florida, the effect was not as great as when the North Florida crop overlapped that of Central Florida. This was probably due to the differences in degree of overlapping in harvest dates and to the fact that the South Georgia volume was not nearly as great as that of North Florida while the North Florida volume was greater than that of Central Florida.

Rate of abandonment between different size operations did not appear to be significant (Table 4). However, varying sizes of operators had about the same rate of abandonment for different reasons. When the f.o.b. price of watermelons falls below one cent a pound, economic abandonment begins. The lower the price the more widespread abandonment becomes. At one-half cent per pound abandonment is

TABLE 4.--Percentage of growers' watermelon crops sold, by size of grower, Florida, 1960

Item	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Percent of crops sold	68	65	70	61	67

widespread. Growers who hired most of their harvest labor and equipment were of the general opinion that it cost more than one-half cent a pound to harvest and load watermelons. The smaller growers, who depended primarily upon their own equipment and family labor for harvesting, tended to load watermelons as long as they could get a return to labor, if they could find a buyer. Quite often the fact that they could not find a buyer at any price was the reason they abandoned their crops.

The larger producers hired substantially all of their harvest labor and hired trucks to haul watermelons from the fields. Thus, when the price of watermelons dropped to the cost of harvesting they reacted immediately by suspending harvest. These growers usually had working agreements with buyers or brokers in order to have a market for

their crop as long as the price was high enough to pay for harvest.

Selling Activities

The smaller growers sold a large part of their watermelons to itinerant truckers who generally loaded at the field (Table 5). The larger growers sold most of their watermelons through brokers who used rail loadings extensively. The itinerant truckers felt that they could buy cheaper if they went directly to the field. The growers, in general, preferred to load there because it meant less handling. Many smaller growers sold to itinerant truckers because they did not know any other way to sell, i.e., they had no contact with established buyers or brokers who preferred to deal with larger growers. Thus, the growers with small acreages often were in the position of sitting and waiting for a buyer to come along.

The "other buyers" in Table 5 were an important source of disposal for all growers but were used most often by those in the medium-size groups (40 to 119 acres). Growers of the medium-size group usually had too many watermelons to sell without assistance, so they often made arrangements with established cash buyers to handle all or part of their

TABLE 5.--Method used in disposing of watermelons, by size of grower, Florida, 1960

Disposition	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
To itinerant truckers	37	28	8	5	78
To other buyers	31	25	17	6	79
Through brokers	11	17	10	9	47
Total	51	40	17	12	204[a]
Percent of Sales:					
To itinerant truckers	46	23	12	5	18
To other buyers	37	51	49	32	43
Through brokers	17	26	39	69	39
Total	100	100	100	100	100

[a]Some growers used more than one means of disposing of their watermelons.

crops. These arrangements could be either formal or informal. They could last for a number of years or only for part of a season.

Loaded on trucks at the field was the point used most often by growers to relinquish control of their watermelons. Growers with small acreages used this point most of

the time (Table 6). Growers with larger acreages used centralized truck loading areas and rail loadings more often than field loading.

TABLE 6.--Point at which growers relinquished control of watermelons during the selling process, by size of grower, Florida, 1960

Point	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Percent of Sales:					
Loaded on truck at the field	57	54	36	36	45
Loaded on truck at central loading point	22	28	48	20	29
Loaded on railroad cars	12	15	14	42	23
Delivered to terminal market	3	3	2	2	2
In the field in bulk	5	. .	. .	. .	1
Individual melons on the vine	1	. .	. .	. .	a
Total	100	100	100	100	100

[a]Less than one-half of 1 percent.

Most watermelons were sold on a single-load basis, i.e., each load was handled as a separate transaction (Table 7).

TABLE 7.--Time arrangements were made for the sale of watermelons, by size of grower, Florida, 1960

Time	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Before each load	45	31	14	6	96
Before harvest season	3	4	1	3	11
Before planting	4	5	3	6	18
During harvest season	1	. .	. .	1	2
Total	53	40	18	16	127[a]
Percent of Growers:					
Before each load	85	77	78	38	75
Before harvest season	6	10	5	18	9
Before planting	7	13	17	38	14
During harvest season	2	. .	. .	6	2
Total	100	100	100	100	100

[a]Some growers had different arrangements for different parts of their crops.

Seventy-five percent were handled in this manner. Growers with 40 acres or less sold 46 percent of their watermelons to itinerant truckers (Table 5). This was the most often used source of disposal for these growers. This group also

sold 85 percent of their watermelons on an individual-load basis, while the larger growers sold only 38 percent of their loads in this manner.

Over one-half of the watermelons sold by the larger growers were sold on the basis of arrangements made either before or after their crops were planted but before harvest began. This group sold 63 percent of their watermelons through brokers. They knew that once the harvest season began they would need help in selling the volume of watermelons they had for harvest; thus, early arrangements were made for disposal of their crops.

Price Determination

Three general methods were used in arriving at the price of watermelons. Some growers accepted without protest the price offered by buyers. Some set a minimum price and refused to sell at a lower figure. Others bargained with buyers for the best price obtainable. For all growers, there was no appreciable difference in the manner in which the selling price was determined (Table 8). However, in 60 percent of the cases reported, the larger growers accepted the price offered by the buyer. At first thought, this may appear unusual but when one considers how the larger growers

TABLE 8.--Methods of price determination for direct sales of watermelons, by size of grower, Florida, 1960

Method	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Accept price buyer offered	16	11	7	6	40
Set minimum price acceptable	16	7	6	2	33
Bargain for best deal	18	6	5	2	40
Total	50	24	18	10	113[a]
Percent of Shipments:					
Accept price buyer offered	32	31	39	60	35
Set minimum price acceptable	32	26	33	20	30
Bargain for best deal	36	43	28	20	35
Total	100	100	100	100	100

[a]Some growers mentioned more than one method while some did not sell direct.

sold, it is quite logical that this relationship existed. These growers often made arrangements for one or more cash buyers to handle their watermelons for the market price the

day they were shipped. Under this type of arrangement, the growers usually accepted the price offered without argument. The method most often used by the two groups of smaller growers to arrive at the selling price was to bargain with the buyer.

The price of watermelons was highest in South Florida and steadily decreased as the harvest season progressed northward (Table 9). The method most often used by the South Florida growers was to bargain for the best price possible. This is what one would expect when there was a sellers' market and the growers were confident they would be able to sell their watermelons. On the other hand, the South Florida growers did not often fall in the category of accepting the price the buyer offered. Most of those who did were probably larger growers who had arrangements with large buyers to handle their watermelons at market price.

The most often used method of price determination among North Florida growers was that of accepting the price offered by the buyer. There was not as much bargaining among this group as there was among South Florida growers. When there was a strong buyers' market with a weak price, as was the situation in the North Florida area, growers were inclined to take the first offer made. Often they were

TABLE 9.--Methods of price determination for direct sales of watermelons, by production areas, Florida, 1960

Method	Production Area			
	North Florida	Central Florida	South Florida	All Florida
Number of Growers:				
Accept price buyer offered	28	8	4	40
Set minimum price acceptable	21	5	7	33
Bargain for best deal	22	9	9	40
Total	71	22	20	113[a]
Percent of Shipments:				
Accept price buyer offered	39	36	20	35
Set minimum price acceptable	30	23	35	30
Bargain for best deal	31	41	45	35
Total	100	100	100	100

[a]Some growers mentioned more than one method while some did not sell direct.

afraid that they would not be able to sell if they tried to bargain for a better price. It appears that when watermelon prices were relatively high, growers felt they were in a position to bargain. When the market was weak they felt

that if they attempted to bargain with the buyers they would lose their sales.

Attitudes and Opinions

The thinking of those in the industry seems to be an important consideration in an evaluation of the effects of any watermelon marketing program. Consequently, attitudes and opinions concerning certain pertinent points were determined for those groups involved.

Shipping-Point Inspection

Fifty percent of the growers interviewed were in favor of compulsory shipping-point inspection of watermelons, 35 percent were opposed, and 15 percent, undecided. Table 10 shows that there was no appreciable difference among the various sizes of growers in their attitude toward compulsory inspection.

When questioned as to their reasons for favoring compulsory inspection, 56 of the 60 growers who answered in the affirmative did so because they felt that it would help keep poor quality watermelons off the market. Table 11 gives a complete listing of reasons why the growers favored compulsory shipping-point inspection.

TABLE 10.--Growers' opinions on compulsory shipping-point inspection of watermelons, by size of grower, Florida, 1960

Opinion	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Favor	25	21	8	6	60
Do not favor	20	13	5	4	42
No opinion	6	6	4	2	18
Total	51	40	17	12	120
Percent of Growers:					
Favor	49	52	47	50	50
Do not favor	39	33	29	33	35
No opinion	12	15	24	17	15
Total	100	100	100	100	100

Growers who opposed compulsory shipping-point inspection were not as uniform in their reasons for opposing as those who favored it were in their reasons for favoring. The most common reason given in opposition was dissatisfaction with the quality of inspection service which was available (Table 12). Some growers questioned the honesty of the inspectors, some questioned their capabilities, while others complained about inspectors being unavailable when needed. The next most important reason for opposing compulsory

TABLE 11.--Reasons why growers favored compulsory shipping-point inspection of watermelons, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Keep poor quality watermelons off the market	56	67
Would increase returns to growers	17	20
Would decrease supply of watermelons	5	6
Would decrease disputes with buyers	3	4
Protect growers' interests	2	2
Centralize sales and thus standardize price	1	1
Total	84	100

[a]Only those who favored compulsory shipping-point inspection were included.

[b]Some growers gave more than one reason.

shipping-point inspection was that growers were afraid they would not be able to sell all their watermelons. This reason was expressed more by smaller growers who also were the group who sold most often to itinerant truckers.

TABLE 12.--Reasons why growers opposed compulsory shipping-point inspection of watermelons, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Unsatisfactory inspection service	25	31
Grower would not be able to sell all his watermelons	15	19
Too much bother	12	15
Would cost too much	12	15
No need for inspection	10	12
Too much governmental interference	3	4
Would help buyers and hurt growers	2	3
Small growers have to sell in field	1	1
Total	80	100

[a]Only those who opposed compulsory shipping-point inspection were included.

[b]Some growers gave more than one reason.

Cooperative Marketing

Sixty-three percent of all growers interviewed stated they were in favor of marketing their watermelons through a cooperative (Table 13). However, many of those who thought a watermelon marketing cooperative would be desirable had reservations about its chances of success. The opinion encountered most often was that a cooperative would

TABLE 13.--Growers' opinions on marketing through a cooperative, by size of grower, Florida, 1960

Opinion	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Favor	38	21	12	5	76
Do not favor	6	8	1	2	17
No opinion	7	11	4	5	27
Total	51	40	17	12	120
Percent of Growers:					
Favor	74	53	71	42	63
Do not favor	12	20	6	16	14
No opinion	14	27	23	42	23
Total	100	100	100	100	100

be a good idea "if you could get the growers to cooperate." Another often heard comment was that a cooperative would be a good thing "if it was run right." The concern, on the part of many growers, that a cooperative would not be run right was based on the fear that a few individuals would get control of the organization. Those in control would then operate it for their own selfish interests.

The reason most often given for favoring a cooperative was that it would prevent individual growers from under-

selling one another (Table 14). Many growers felt that the market was affected adversely by individual growers dropping the price during the process of bargaining with buyers, especially with itinerant truckers. The second most important reason for favoring a cooperative was that one would place the growers in a stronger bargaining position and thereby help maintain a reasonable price.

TABLE 14.--Reasons why growers favored marketing watermelons through a cooperative, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Growers would not be underselling each other	52	42
Better bargaining position	42	34
Be easier to sell watermelons	13	11
Would have specialists to handle selling	11	9
Would cost less to sell watermelons	1	1
Cut out broker	1	1
Keep poor quality watermelons off the market	1	1
Would have better distribution of watermelons	1	1
Total	122	100

[a]Only those who favored a watermelon marketing cooperative were included.

[b]Some growers gave more than one reason.

The reasons growers gave for being opposed to selling their watermelons through a cooperative were quite varied, as indicated by Table 15. No one reason was mentioned by more than five growers.

TABLE 15.--Reasons why growers opposed marketing watermelons through a cooperative, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Grower could make more by selling own watermelons	5	23
Would receive no benefit	5	23
Growers would not cooperate	3	14
Just wouldn't work	3	14
Another middleman to get his cut	3	14
Just does not believe in cooperatives	1	4
Wants his money when he sells	1	4
Watermelons are too big a deal for a cooperative to handle	1	4
Total	22	100

[a]Only those growers who opposed a watermelon cooperative were included.

[b]Some growers gave more than one reason.

Marketing Agreement

It was the opinion of the writer that the watermelon growers, as a group, were not familiar with the purpose nor the method of operation of Federal marketing agreements and orders. In questioning growers on this point, the writer made certain that the question was not misinterpreted by the respondent. Growers knew that a Federal marketing agreement and order was under discussion. When questioned concerning their knowledge of marketing agreements, only 41 of the 120 responding growers expressed any knowledge concerning their purpose or method of operation. Table 16 shows the familiarity with marketing agreements by size of grower. There was a definite relationship between size of grower and his knowledge of marketing agreements. A greater percentage of the larger growers were familiar with them.

Those growers who expressed knowledge of marketing agreements were questioned as to whether they favored one for watermelons. Except for the largest growers, 50 percent favored a marketing agreement, while for this one group only 29 percent favored one (Table 17). Fifty-one percent of all growers were opposed.

Of the 19 growers who favored a marketing agreement, 17 gave as a reason that one could keep low-quality water-

TABLE 16.--Familiarity of watermelon growers with the operation of marketing agreements, by size of grower, Florida, 1960

Familiarity	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Familiar	12	14	8	7	41
Not familiar	39	26	9	5	79
Total	51	40	17	12	120
Percent of Growers:					
Familiar	24	35	47	58	34
Not familiar	76	65	53	42	66
Total	100	100	100	100	100

melons off the market. Table 18 gives all reasons expressed. Those who opposed marketing agreements had a wide variety of reasons, as shown in Table 19. No one reason can be singled out as being of prime importance.

TABLE 17.--Desirability of a watermelon marketing agreement, by size of grower, Florida, 1960[a]

Opinion	Acres per Grower				
	Under 40	40-79	80-119	120 and over	All Growers
Number of Growers:					
Favor	6	7	4	2	19
Do not favor	6	6	4	5	21
No opinion	. .	1	. .	. .	1
Total	12	14	8	7	41
Percent of Growers:					
Favor	50	50	50	29	46
Do not favor	50	43	50	71	51
No opinion	. .	7	. .	. .	3
Total	100	100	100	100	100

[a]Only those growers who expressed familiarity with the operations of marketing agreements were included.

TABLE 18.--Reasons why growers favored a watermelon marketing agreement, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Keep low-quality watermelons off the market	17	76
Standardize grades and sizes	2	9
Limit supply moving to market	1	5
Would stabilize the industry	1	5
Keep growers informed as to acreage and yield	1	5
Total	22	100

[a]Only those growers who favored a watermelon marketing agreement were included.

[b]Some growers gave more than one reason.

TABLE 19.--Reasons why growers opposed a watermelon marketing agreement, Florida, 1960[a]

Reason	Number of Growers[b]	Percent of Total
Too much governmental interference	5	19
Would do no good	5	19
Grower would not be able to sell all his watermelons	5	19
Wrong people would run it	3	11
Would make less money	2	7
Grower could not sell watermelons like he wants to	2	7
Supply and demand establishes the market	2	7
Does not want compulsory inspection	2	7
There is no way to control the movement of watermelons	1	4
Total	27	100

[a]Only those growers who opposed a watermelon marketing agreement were included.

[b]Some growers gave more than one reason.

Suggestions for Improving Watermelon Marketing

When asked for suggestions for improving the watermelon market, a wide variety of answers were given by growers. Some gave numerous suggestions while others gave none. Compulsory shipping-point inspection, marketing cooperatives,

and marketing agreements were excluded from possible answers because they had been discussed as separate topics. The suggestions ranged from acreage allotments, which were mentioned by 34 growers, to vertical integration, which was mentioned by one grower. In all, 21 separate classifications were made from the many specific suggestions (Table 20). The most often mentioned way of improving the market was to reduce the supply of watermelons available for market. Acreage allotment was mentioned so often it was listed separately in Table 20 while all other methods of reducing supply were combined into one category. In all, 48 growers made direct suggestions that supply be reduced. The next most often mentioned remedy was to market only good-quality watermelons. This would also reduce supply.

Itinerant Truckers

Itinerant truckers have established themselves as an important part of the watermelon market. In 1960 they bought approximately 10 percent of the watermelons sold by Florida growers.[1] It is difficult to get an accurate picture

[1]This is an estimate based upon an examination of the state road guard station watermelon passing reports and an estimate of itinerant trucker movements west of the Suwannee River, which were assumed to be in the same proportion to the total watermelon shipments as they were east and south of this line.

TABLE 20.--Growers' suggestions for improving watermelon marketing, Florida, 1960

Suggestion	Number of Growers	Percent of Total
Acreage allotment	34	30
Reduce supply (other than acreage allotment)	14	12
Market only good-quality watermelons	14	12
Control middlemen's activities	7	6
Up-to-the-minute market news	6	5
Take Charleston Grey watermelon out of production	5	4
Have honest and dependable brokers	4	4
Keep chain stores from controlling the market	4	4
Have a set price that all buyers must pay	3	3
Have a cash market with no consigned sales	3	3
Have cut-off dates for shipments from different areas	3	3
State-wide selling organization	2	2
Have sale of watermelons in strong hands	2	2
More large buyers	2	2
Watermelon auction	2	2
Educate the farmers to the ways of marketing	1	1
Price support	1	1
Have small-type watermelon	1	1
More trucks for hauling watermelons out	1	1
Minimum wage for farm labor	1	1
Vertical integration	1	1
Total	111	100

of their over-all operations and their influence in the market. However, in certain areas their influence is considerable.

Most itinerant truckers had hauled watermelons from Florida a relatively short period of time. Forty-five percent of those interviewed had been in the business for five years or less (Table 21). Only 12 percent had been hauling from Florida for more than 15 years. The 1960 season was the first for many truckers. However, one stated he had been hauling watermelons from the state for 38 years. The volume handled varied widely (Table 22). Thirty-eight percent estimated they would handle five loads or less during the 1960 season, while one trucker stated that he would buy 150 loads.

Some truckers start hauling watermelons at the beginning of the Florida season and continue into other states until the end of the season in the North. Other truckers are more limited in their operations. Table 23 shows that 17 percent of those interviewed expected to end the season with Florida watermelons, while 12 percent hauled from Florida and planned to haul from more than three other states.

Table 24 gives the state of destination of the truckers who were interviewed. These destinations are for

TABLE 21.--Number of years itinerant truckers had handled Florida watermelons, Florida, 1960

Years	Number of Truckers	Percent of Total
1 - 5	41	45
6 - 10	24	26
11 - 15	15	17
16 or more	11	12
Total	91	100

TABLE 22.--Estimated number of loads of Florida watermelons per itinerant trucker, Florida, 1960

Loads	Number of Truckers	Percent of Total
1 - 5	35	38
6 - 10	29	32
11 or more	27	30
Total	91	100

those watermelons loaded at time of interviews. By far the greater number of loads were hauled to southern states. This is to be expected. Most of these loads were about 25,000 pounds or less, while most loads which the truckers were hauling for freight only ranged between 30,000 and 40,000 pounds. Itinerant truckers concentrated on supplying

TABLE 23.--Number of states, in addition to Florida, from which itinerant truckers estimated they would haul watermelons, 1960

Number of States	Number of Truckers	Percent of Total
0	15	17
1	32	35
2	19	21
3	14	15
4 or more	11	12
Total	91	100

nearby markets. Table 25, which gives the home state of the itinerant truckers, compares quite closely with Table 24. The comparison between these two tables tends to support the opinion that most truckers haul watermelons to their home territory.

Buying Practices

The itinerant truckers' system of contacting growers in order to buy watermelons was disorganized. Usually when they entered an area to buy watermelons they had no idea from whom they would purchase. In many cases they did not even know if they would be able to load the kind of watermelons they wanted and they had only vague knowledge of the

TABLE 24.--Destination of itinerant truckers hauling watermelons, Florida, 1960[a]

Destination	Number of Loads	Percent of Total
Alabama	15	17
South Carolina	11	12
Florida	9	10
Tennessee	8	9
Georgia	7	8
Kentucky	6	7
Ohio	6	7
Virginia	5	6
Louisiana	4	4
Arkansas	4	4
Pennsylvania	3	3
Mississippi	2	2
North Carolina	2	2
Missouri	2	2
Illinois	1	1
New York	1	1
West Virginia	1	1
Connecticut	1	1
Texas	1	1
Unknown	2	2
Total	91	100

[a]Includes only the loads of watermelons the itinerant truckers had at the time of the interviews.

TABLE 25.--Home state of itinerant truckers hauling watermelons, Florida, 1960

State	Number of Truckers	Percent of Total
Alabama	17	18
Florida	15	16
Kentucky	7	8
Georgia	6	7
North Carolina	5	6
Tennessee	5	6
Virginia	5	6
Mississippi	5	6
Arkansas	5	6
South Carolina	4	4
Louisiana	3	3
Pennsylvania	3	3
West Virginia	2	2
Missouri	2	2
Connecticut	1	1
Illinois	1	1
Indiana	1	1
New Jersey	1	1
New York	1	1
Ohio	1	1
Texas	1	1
Total	91	100

price they would have to pay. When a trucker drove into a watermelon-producing area he started looking for a grower who had watermelons for sale. The most often used method of contacting growers was to go to a location that was being used as a general meeting and loading point (Table 26).

TABLE 26.--Methods used by itinerant truckers in contacting watermelon growers, Florida, 1960[a]

Method	Number of Truckers	Percent of Total
Met at centralized loading point	33	36
Saw his watermelons while riding on highway	32	35
Was referred to him	19	21
Bought other commodities from grower earlier	4	5
Through a truck broker	1	1
Saw sign advertising watermelons	1	1
Stopped at grower's house while looking for watermelons	1	1
Total	91	100

[a]For loads truckers had at time of interviews.

Many growers, especially those with smaller acreages, congregated around such places until they made contact with a buyer. Another method, used almost as often, was to ride down the highway looking for watermelons. During the harvest-

ing season many growers piled watermelons under a tree by the side of the highway for the purpose of attracting buyers.

Some itinerant truckers, after establishing contact, returned in succeeding years to the same grower, but this was not the general practice. Sixty-seven percent of the truckers interviewed were buying from the particular grower for the first time. Thus, only 33 percent were dealing with growers from whom they had bought in previous years.

The interviews with itinerant truckers were made during two different periods of time. The price paid by the truckers for watermelons during each of these periods varied considerably (Table 27). The price level apparently influenced the method by which price was determined. Table 27 shows that during the high price period, May 17 to June 3, price of 76 percent of the loads was arrived at by the trucker paying the going price with no effective bargaining. This was a "sellers' market" period. The period June 13 to June 29 was one of a "buyers' market" and the price was considerably lower. Under these conditions the prices of 53 percent of the loads were arrived at by a process of bargaining between truckers and growers.

TABLE 27.--Price of watermelons and method used by itinerant truckers in determining price, by dates, Florida, 1960

Item	Period			
	May 17-June 3	June 13-June 29	May 17-June 3	June 13-June 29
Average price for period (cents per pound)	2.99	1.09	2.99	1.09
	Number of Loads		Percent	
Method of price determination:				
Pay going price	22	29	76	47
Bargain for best buy	7	33	24	53
Total	29	62	100	100

The general price level of watermelons influenced the quality truckers bought. During the high-price period, 38 percent of the watermelons bought were culls (Table 28). During the period of low price, only 3 percent were culls. This relationship tends to substantiate the belief of many in the industry that itinerant truckers haul poor quality watermelons to market. This appears to be true during the periods of high prices.

TABLE 28.--Grades of watermelons bought by itinerant truckers, by dates, Florida, 1960

Grade	Period			
	May 17-June 3	June 13-June 29	May 17-June 3	June 13-June 29
	Number of Loads		Percent	
Field run	18	60	62	97
Culls[a]	11	2	38	3
Total	29	62	100	100

[a]Watermelons which had been graded out of previous loadings.

Sales Outlets

In disposing of their watermelons on the terminal markets the itinerant truckers used a variety of outlets (Table 29). Independent retailers and jobbers were used extensively. Sometimes truckers would sell directly to these two types of buyers at their places of business, but often the sales were made on produce markets. Of the sales made directly to consumers, some were peddled from the trucks while others were sold through fruit and vegetable stands operated by the truckers.

TABLE 29.--Types of buyers to whom itinerant truckers sold watermelons, Florida, 1960

Type of Buyer	Number of Buyers	Percent of Total
Independent retailers	53	32
Jobbers	45	27
Direct to consumers	39	23
Chain stores	30	18
Total	167[a]	100

[a]Some truckers gave more than one type of buyer.

Attitudes and Opinions

Shipping-Point Inspection

Sixty-one percent of the itinerant truckers interviewed favored compulsory shipping-point inspection (Table 30). Only 29 percent disapproved. Some of the truckers who hauled cull watermelons favored compulsory shipping-point inspection. Even though they did not like to handle culls, some said they had to buy the cheaper, poor quality watermelons in order to compete with other truckers. When giving reasons why they favored compulsory shipping-point inspection that most often mentioned was to keep poor quality watermelons off the market (Table 31). During the interviews many truckers were quite concerned about the poor

TABLE 30.--Itinerant truckers' opinions on compulsory shipping-point inspection of watermelons, Florida, 1960

Opinion	Number of Truckers	Percent of Total
Favor	56	61
Oppose	26	29
No opinion	9	10
Total	91	100

TABLE 31.--Reasons why itinerant truckers favored compulsory shipping-point inspection of watermelons, Florida, 1960[a]

Reason	Number of Truckers[b]	Percent of Total
Keep poor quality watermelons off the market	35	56
Protect buyers against getting bad watermelons	15	24
Standardize grades and sizes going to market	5	8
Easier to sell graded watermelons	4	6
Less confusion in the market	4	6
Total	63	100

[a]Only those truckers who favored compulsory shipping-point inspection were included.

[b]Some truckers gave more than one reason.

quality watermelons with which they had to compete in the terminal market. They found it difficult to sell good watermelons for a reasonable price because someone else was in the same market selling culls at a much lower price. The statement, "the poor quality watermelon sets the market," was often made by the itinerant truckers who wanted to keep poor quality off the market. They were of the opinion that relatively few culls on a market could depress the price out of proportion to their quantity. The reasons given were that (1) their low selling price caused an immediate depressing effect on the price of all watermelons and (2) that many people who bought the culls would be dissatisfied with their quality and would use fewer watermelons in the future.

The most often voiced objection to compulsory shipping-point inspection was that the truckers did not need inspection (Table 32). Without exception, every itinerant trucker acted as his own inspector. They usually did their own packing. Those who did not pack were on the trucks looking over every watermelon for quality and size. Most truckers felt they were able to get the quality watermelons they bargained for without the help of a government inspector. Of all the truckers interviewed not one had his watermelons inspected by a government inspector. Since 61 percent

of the truckers favored compulsory shipping-point inspection, one must conclude that they did so for the purpose of regulating others.

TABLE 32.--Reasons why itinerant truckers opposed compulsory shipping-point inspection, Florida, 1960[a]

Reason	Number of Truckers[b]	Percent of Total
Not necessary for trucker's business	13	42
Small truckers couldn't operate due to high price	6	19
Grower couldn't sell all his watermelons	5	16
Too much bother	3	10
Cost too much	2	7
Inspectors too strict	1	3
Too much graft	1	3
Total	31	100

[a]Only those truckers who opposed compulsory shipping-point inspection were included.

[b]Some truckers gave more than one reason.

Suggestions for Improving Watermelon Marketing

Comparing Table 33 with Table 20 one will notice that itinerant truckers and growers agree to a considerable extent on ways of improving the watermelon market. The

TABLE 33.--Itinerant truckers' suggestions for improving watermelon marketing, Florida, 1960[a]

Suggestion	Number of Truckers	Percent of Total
Market only good quality watermelons	16	31
Reduce quantity of watermelons	6	11
Have uniform price	5	9
No consigned selling	4	8
Regulate chain stores' operations	4	8
Increase varieties of watermelons available	3	6
Marketing agreement	2	4
Miscellaneous suggestions[b]	12	23
Total	52	100

[a]Compulsory shipping-point inspection eliminated as a possible answer because it had been discussed separately.

[b]Includes suggestions made only once.

growers were most concerned with reducing supply. Their next most often mentioned suggestion was to market only good quality watermelons. The itinerant truckers also included these as their two most often mentioned suggestions; however, they reversed their order, giving quality considerations as most important and supply next.

Watermelon Handlers

The 28 handlers interviewed handled approximately 9,723 units of watermelons during the 1960 season. These units included both rail carloads and truckloads and were about 47 percent of the total 1960 Florida shipments.[2] The size of operators' activities ranged from 40 units per season to nearly 2,000.

Marketing Activities

Small handlers often operated alone; the same individual handling both buying and selling. Sometimes the small handlers would operate at the shipping point doing the buying, with a partner on the terminal market handling the sales. Large handlers operated with a staff of field men who did the buying and soliciting of the growers and a sales force who handled the sales.

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[2]Total 1960 Florida shipments were 24,628 carlot equivalents of which 85 percent were shipped by truck. The conversion factor for a carlot equivalent is 28,000 pounds. A sample of handlers' invoices gave the average truckload as 1,216 carlot equivalents. Using an 85 percent truck shipment and 1.216 conversion factor from truckloads to carloads the 9,723 units shipped by the 28 handlers equaled 11,507 carlot equivalents. This was about 47 percent of the total Florida shipments.

Method of Operation

Small handlers bought 79 percent of the watermelons they handled, while the large handlers bought only 54 percent of their total volume (Table 34). The large handlers were well-established firms which had been in the watermelon business for a number of years and were well known by the growers. When a grower sells his watermelons f.o.b. he is not especially selective as to whom he sells, but when he picks a broker to sell for his account he is much more particular. Perhaps this explains why the small handlers, who were largely individuals new in the business, bought such a high percentage of their watermelons, while the large handlers bought a smaller proportion of their volume. The large handlers also shipped more of their watermelons on a brokerage basis than did the small ones.

Sixty-one percent of the watermelons shipped by all handlers were bought f.o.b. shipping point by the handler for resale, while only 21 percent were handled on a brokerage basis and 18 percent of the shipments were those in which the handlers had some financial interest in producing. Individual handlers varied greatly in these operations. Eleven reported that their entire operations were handled on an outright purchase basis (i.e., they produced no watermelons

TABLE 34.--Method of operation of watermelon handlers, by size of handler, Florida, 1960

Method of Operation	Units per Handler[a]			
	0-199	200-399	400 and over	All Handlers
Percent of Handlers:				
As a buyer	79	71	54	61
As a selling broker	13	20	22	21
Handling own watermelons[b]	8	9	24	18
Total	100	100	100	100

[a] "Units" refers to one carload or one truckload of watermelons. In figuring total volume, handlers usually do not differentiate between the two.

[b] "Own watermelons" refers to those which the handler had a financial interest in producing.

nor did they handle any on a brokerage basis). Some stated that they liked to operate as buyers because it prevented disputes and ill feelings with growers. There were no handlers who operated entirely as brokers, even though one stated that 90 percent of his operations were as a broker and he financed the production of the other 10 percent. This was the only respondent among the handlers who did not buy at least 15 percent of the watermelons he handled.

Sales Activities

Sixty percent of all sales made by the handlers interviewed were on a delivered[3] basis (Table 35). Small handlers used this type of sale 92 percent of the time while the large handlers sold only 50 percent of their volume on this basis. A possible explanation of this difference is the fact that delivered sales have an implication of distrust of the shipper by the buyer. Small handlers, in general, were relatively new in the business; therefore, they had not developed a reputation for fair dealings. On the other hand, large handlers had been in the business for many years and were well known in the watermelon industry. For large handlers, an often used type of sale (44 percent of the time) was f.o.b.[4] while small handlers used this method only 8 percent of the time. Joint account sales and consigned sales were rarely used by any of the handlers. These two types accounted for only 4 percent of the total.

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[3]Delivered sales refer to transactions in which the shipper assumes the risk in transit and the price is determined on a terminal market basis. The watermelons must also meet size and quality specifications at the terminal market.

[4]F.o.b. sales, as used here, refer to transactions in which it was the responsibility of the shipper to deliver to the shipping point watermelons of the grade and size agreed upon. The price was determined at the shipping point.

TABLE 35.--Types of sales made by watermelon handlers, by size of handler, Florida, 1960

Type of Sale	Units per Handler			
	0-199	200-399	400 and over	All Handlers
Percent of Handlers:				
Delivered	92	76	50	60
F.o.b.	8	23	44	36
Joint account	. .	. .	4	3
Consigned	. .	1	2	1
Total	100	100	100	100

Most of these were made by the large handlers. As a general rule, handlers neither consigned nor handled on joint account unless they had no other method of disposing of watermelons. Apparently large handlers, at times, found they had more watermelons than they could sell. The only alternatives then were to have them handled on joint account or on consignment.

Selling Charges

On the average, handlers made selling charges of $40.00 per carload and $46.00 per truckload. However, charges made by different handlers varied considerably. They ranged from $25.00 per unit by one small handler (who reported that

he handled on brokerage) to $75.00 per unit charged by one of the large ones. Some had one charge for rail carloads and a higher charge for truckloads. In each case where charges differed, the amount for truckloads was greater than for rail carloads. Many mentioned that there were more inconveniences involved in selling truckloads; they were harder to keep up with. Also, more watermelons were loaded per truckload. Seven of the 12 who gave a list of charges had the same price for both rail and truck. The large handlers had a higher charge than did smaller ones for both types of loads (Table 36). Perhaps this was because they enjoyed an established reputation in the industry and growers were willing to pay more, thinking that large handlers could get better prices on brokerage sales. On the other hand, the small handlers were comparative newcomers to the industry who did not enjoy the confidence of the growers.

TABLE 36.--Average charges for selling watermelons, by size of handler, Florida, 1960

Unit Sold	Units per Handler			
	0-199	200-399	400 and over	All Handlers
Dollars per Unit:				
Railroad car	25	34	50	40
Truckload	25	41	57	46

Types of Sales

Many of the large chain stores had their own buyers in the field purchasing watermelons direct from the growers. These chains also bought from watermelon handlers because they considered it too expensive to maintain a field staff large enough to supply all their needs at all times. Small chain stores did not have a field staff buying watermelons; consequently, they depended primarily upon handlers to furnish their needs. Under such conditions it would appear that chain stores should be an important market for handlers. This relationship did exist (Table 37). Fifty-two percent of all watermelons sold by handlers went to chain stores, with no apparent relationship between size of handler and the proportion sold to this outlet.

To a large extent, chain stores bought watermelons without inspection and hauled in trucks with sales on a

TABLE 37.--Proportion of handlers' sales made to chain stores, by size of handler, Florida, 1960

Units per Handler	Percent of Sales to Chain Stores
0-199	52
200-399	67
400 and over	45
All handlers	52

delivered basis (Table 38). Since they bought on a delivered basis, they did not need the protection offered by Government inspection--consequently, the low rate of inspection. The primary reason for the high rate of truck transportation was that they could get a number of store-door deliveries from the same truckload. This eliminated much of the terminal market rehandling necessary with rail deliveries. The jobbers purchased more on an f.o.b. basis with higher rates of inspection and rail deliveries.

Distribution of Shipments

Handlers' shipments were primarily to states of heavy population concentration in the Northeast and Midwest (Table 39). This contrasted noticeably with the distribution of itinerant truckers' shipments in the Southeast (Table 24).

Financing Production

Thirty-two percent of all handlers interviewed financed watermelon production (Table 40). A much higher proportion (57 percent) of the large handlers performed this service. Of the nine handlers who financed production, five were from Florida. They financed a total of 2,940 acres. The four from out-of-state financed a total of 905 acres.

TABLE 38.--Type of sale, type of transportation, and inspection of watermelons, by type of buyer, Florida, 1960[a]

Item	Type of Buyer				
	Chain	Jobber[b]	Broker	Others[c]	All Handlers
	Percent[d]				
Type of Sale:					
Delivered	63	27	31	79	42
F.o.b.	37	73	69	21	58
Total	100	100	100	100	100
Type of Transportation:					
Truck	91	54	72	81	70
Rail	9	46	28	19	30
Total	100	100	100	100	100
Inspection:					
Inspected	16	50	30	58	35
Not inspected	84	50	70	42	65
Total	100	100	100	100	100

[a]Data obtained from shippers' invoices.

[b]Jobber referred to any individual or firm buying watermelons for resale to retailers.

[c]Others included sales to the military and to retailers, other than chains.

[d]Percentages were computed on the basis of units sold and do not refer to weight or number of watermelons.

TABLE 39.--States of destination of Florida watermelon shipments, 1960[a]

State	Number of Shipments	Percent of Total
New York	119	17
Pennsylvania	90	13
Ohio	60	8
Florida	44	6
New Jersey	43	6
Canada	39	5
Michigan	38	5
Connecticut	33	5
Illinois	32	5
Massachusetts	23	3
Virginia	18	3
Louisiana	17	2
West Virginia	15	2
Indiana	14	2
South Carolina	13	2
Maryland	11	2
Kentucky	10	1
Wisconsin	10	1
Washington, D. C.	9	1
Maine	7	1
Missouri	7	1
New Hampshire	7	1
North Carolina	7	1
Rhode Island	5	1
Texas	5	1
Georgia	4	1
Alabama	3	b
Other states[c]	10	1
Unknown	20	3
Total	713	100

[a]Data taken from handlers' shipping invoices.

[b]Less than one-half of 1 percent.

[c]No state received more than two loads.

TABLE 40.--Number and proportion of watermelon handlers who financed production, by size of handler, Florida, 1960

Units per Handler	Number of Handlers	Percent of Total
0 - 199	2	25
200 - 399	3	23
400 and over	4	57
All handlers	9	32

Most of the funds used in financing were the handlers' own; two Florida handlers were the only ones who reported using money other than their own and it came from local banks.

The financing of watermelon production by handlers appears to be declining even though it was still an important source of supply for some. While there are no statistics available for comparing different time periods, none of the handlers interviewed were increasing their activities in this field. Most of those who financed watermelon production in 1960 were either decreasing this operation or else quitting completely. Of the nine handlers who financed production, eight stated they began in order to obtain a dependable volume. However, it was the opinion of most that this need was no longer present. Some handlers gave additional reasons for financing production; two stated that they did

it in order to make money from production and two said that they did it as a favor to a friend or relative.

Attitudes and Opinions

Shipping-Point Inspection

As a group, handlers were almost evenly divided on the question of compulsory shipping-point inspection. One-half of those interviewed were opposed, 46 percent favored, and 4 percent were undecided (Table 41). There appeared to be no relationship between the size of the handlers' operations and attitude toward this matter. When asked why they favored compulsory shipping-point inspection, the principal reason stated was a desire to keep poor quality watermelons

TABLE 41.--Watermelon handlers' opinions on compulsory shipping-point inspection, by size of handler, Florida, 1960

Opinion	Units per Handler			
	0-199	200-399	400 and over	All Handlers
Percent of Handlers:				
Favor	50	38	57	46
Oppose	50	62	29	50
Undecided	. .	. .	14	4
Total	100	100	100	100

off the market (Table 42). Those who opposed were not in as close an agreement. The most often mentioned reason for opposition was that it would be of no benefit (Table 43). Cost was the second most important reason for opposition.

TABLE 42.--Reasons why handlers favored compulsory shipping-point inspection of watermelons, Florida, 1960[a]

Reason	Number of Handlers[b]	Percent of Total
Keep poor quality watermelons off the market	12	60
Standardize grades and sizes going to market	4	20
Help eliminate bickering with buyers	2	10
Help control itinerant truckers	1	5
Give sellers protection on terminal market	1	5
Total	20	100

[a]Only those handlers who favored compulsory shipping-point inspection were included.

[b]Some handlers gave more than one reason.

TABLE 43.--Reasons why handlers opposed compulsory shipping-point inspection of watermelons, Florida, 1960[a]

Reason	Number of Handlers[b]	Percent of Total
Would be of no benefit	8	32
Cost too much	7	28
Inspectors are not competent	6	24
Too much bother	2	8
Growers would make more without it	2	8
Total	25	100

[a]Only those handlers who opposed compulsory shipping-point inspection were included.

[b]Some handlers gave more than one reason.

Marketing Agreements

Watermelon handlers, as a group, were in favor of a marketing agreement. Sixty-one percent were in favor, 28 percent opposed, and 11 percent were undecided. The reason most often mentioned for favoring a marketing agreement was to keep poor quality watermelons off the market (Table 44). There was no uniformity of reasoning among those who were opposed to one. The two most often mentioned reasons were that one would interfere with the natural marketing process and that inspection would be too big a job (Table 45).

TABLE 44.--Reasons why handlers favored a watermelon marketing agreement, Florida, 1960[a]

Reason	Number of Handlers[b]	Percent of Total
Keep low quality watermelons off the market	16	59
Standardize grades and sizes	5	19
Stabilize the watermelon industry	2	7
Reduce supply going to market	2	7
Enforce inspection	1	4
Keep small watermelons off the market	1	4
Total	27	100

[a]Only those handlers who favored a marketing agreement were included.

[b]Some handlers gave more than one reason.

TABLE 45.--Reasons why handlers opposed a watermelon marketing agreement, Florida, 1960[a]

Reason	Number of Handlers[b]	Percent of Total
Interferes with natural marketing process	3	23
Inspection involved would be too big a job	3	23
Too much governmental interference	2	14
Unpleasant experience with previous one	1	8
Would involve dishonesty and corruption	1	8
Growers would make more without one	1	8
Could not be administered fairly	1	8
Poor quality inspection	1	8
Total	13	100

[a]Only those handlers who opposed a watermelon marketing agreement were included.

[b]Some handlers gave more than one reason.

Suggestions for Improving Watermelon Marketing

When asked for suggestions for improving watermelon marketing, handlers gave a wide range of answers (Table 46). The two suggestions given most often were: (1) ship only good quality watermelons and (2) keep chain stores from

controlling the market. These same suggestions, or similar ones, were also prominent among those made by growers and itinerant truckers.

TABLE 46.--Handlers' suggestions for improving watermelon marketing, Florida, 1960

Suggestion[a]	Number of Handlers[b]	Percent of Total
Ship only good quality watermelons	4	14
Keep chain stores from controlling the market	4	14
Control volume of watermelons going to market	2	7
Grow another variety of watermelon	2	7
Have competent inspection	2	7
State marketing regulations	2	7
Miscellaneous suggestions[c]	13	44
Total	29	100

[a]Marketing agreements and compulsory shipping-point inspection were eliminated as possible answers because they had been discussed separately.

[b]Some handlers gave more than one suggestion while others gave none.

[c]No suggestion in this group was given more than once.

CHAPTER III

PRICE ANALYSIS

Before an effective marketing program can be developed for watermelons, it is important to know the effect that various factors have on price. This is important in order that the probable effect of any program on income of watermelon growers can be anticipated.

Farmers acting individually can, in the normal process of marketing, affect some variables which influence price.

Factors Which Individual Farmers Can Influence

Each farmer determines, by his own actions, who buys his watermelons. He has (within limits) a choice as to the type of buyer to whom he sells and the type of sale he makes.

Types of Buyers

Many farmers, truckers, and watermelon handlers expressed the opinion that chain stores were responsible for low prices. The belief was that chain store organizations

used their influence as large buyers to depress prices.

Comparisons were made of the prices paid by chain store buyers and jobbers[1] to see if type of buyer affected price. Data on other buyers were insufficient to make satisfactory comparisons. Prices used were daily averages of all sales for each date concerned. No price was used for either chain store or jobber for any date for which there was not at least one sale to each type of buyer. Table 47 shows the price variations and variations in number of sales to the different types of buyers for different dates during the season. Chain stores paid higher prices than jobbers some days, while the reverse was true on other days. The over-all difference in prices paid by these two types of buyers was negligible.

There were numerous complaints that chain stores operated in a manner which depressed the price of watermelons. The contention was that they established the price. A comparison of the prices which handlers received from chain stores and jobbers (Table 48) is inconclusive on this point.

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[1]As used here, jobbers were wholesale buyers who sold to other wholesalers or to retailers.

TABLE 47.--Prices paid for watermelons and number of loads purchased by types of buyers and dates, Florida, 1960

Date		Type of Buyer					
		Chain	Jobber	Others[a]	Chain	Jobber	Others
		Daily Shipping-Point Price (Cents per Pound)			Number of Loads		
May	2	. .	7.0[b]	. .	. .	2	. .
	3	. .	. .	6.7	. .	. .	1
	4	. .	. .	. .	. .	. .	. .
	5	5.8[b]	. .	. .	2	. .	. .
	6	6.0	5.8	. .	1	1	. .
	7	5.6	5.8	5.8	2	1	1
	8	5.8	5.5	. .	1	1	. .
	9	5.8[b]	. .	. .	3	. .	. .
	10	5.7	5.0	. .	1	2	. .
	11	5.2[b]	. .	. .	1	. .	. .
	12	4.8	5.5	. .	1	1	. .
	13	4.4	5.8	. .	1	1	. .
	14	4.5	4.4	4.7	4	4	2
	15	4.2[b]	. .	. .	1	. .	. .
	16	4.3	4.5	. .	3	1	. .
	17	4.2[b]	. .	3.8	1	. .	1
	18	3.9	3.9	. .	5	7	. .
	19	4.0	3.9	4.0	1	4	2
	20	4.0	3.8	3.8	6	9	4
	21	3.8	3.4	4.1	6	3	3
	22	3.8	3.4	3.3	3	7	2
	23	3.5	3.1	. .	3	4	. .
	24	3.1	2.6	3.0	8	3	3
	25	2.6	3.0	3.1	3	4	1
	26	2.9	3.1	. .	4	1	. .
	27	3.5	3.0	. .	2	2	. .
	28	2.9	3.0	3.3	6	1	2
	29	2.7	2.8	3.4	4	1	3
	30	3.3	2.9	3.5	3	2	3
	31	3.1	3.1	3.2	10	5	1
June	1	3.0	2.8	2.9	2	6	4

TABLE 47.--Continued

Date	Type of Buyer					
	Chain	Jobber	Others[a]	Chain	Jobber	Others
	Daily Shipping-Point Price (Cents per Pound)			Number of Loads		
June 2	2.5	2.7	2.4	2	2	6
3	3.0	3.0	3.1	2	5	2
4	2.0	2.9	. .	1	9	. .
5	3.1	2.9	2.1	2	4	3
6	2.6	3.0	2.8	7	6	1
7	2.2	2.5	2.2	4	9	1
8	2.0	2.3	2.4	1	6	2
9	2.2	2.3	2.3	3	7	4
10	2.0	2.3	2.0	5	16	3
11	2.0	2.0	2.2	4	16	3
12	1.6	1.9	1.4	3	6	1
13	1.7	1.7	1.4	5	9	5
14	1.5	1.2	1.4	9	13	6
15	1.2	1.4	1.0	3	4	2
16	1.2	1.2	1.2	9	14	1
17	1.2	1.2	1.0	5	12	2
18	1.2	1.3	1.0	3	12	2
19	1.2	1.4	1.0	4	3	5
20	1.2	1.1	1.1	6	14	5
21	1.0	1.1	1.3	9	14	5
22	1.2	1.1	1.1	4	11	4
23	1.0	1.0	1.3	6	7	3
24	1.2	1.2	.9	12	8	3
25	1.0	1.2	.8	10	8	6
26	1.0	1.0	.9	5	1	4
27	.8	.7	1.0	7	3	2
28	1.0	1.1	.7	8	5	4
29	.8	.9	.6	1	1	1
30	.8	1.0	.3	2	5	1
July 1	1.0	1.0[b]	.6	1	4	1
2	. .	1.1	. .	. .	5	. .

TABLE 47.--Continued

Date	Type of Buyer					
	Chain	Jobber	Others[a]	Chain	Jobber	Others
	Daily Shipping-Point Price (Cents per Pound)			Number of Loads		
July 3	.9	.8	. .	1	1	. .
4	1.1[b]	. .	. .	1	. .	. .
5	.8	.9	.6	1	5	2
6	.9	1.0	1.0	2	1	1
7	.9	1.0	.7	3	1	3
8	.8[b]	. .	.5	1	. .	3
9	.8	.7	. .	1	2	. .
10	. .	. .	. .	. .	. .	. .
11	.7	.5	. .	1	1	. .
12	.5[b]	. .	. .	2	. .	. .
13	.6[b]	. .	. .	1	. .	. .
Average Price[c]	2.42	2.45	. .	. .	. .	. .

[a]Included sales to the military, independent retailers, and unknown buyers.

[b]These prices were not used in calculating average prices as there were no prices for other types of buyers (chain or jobber) on these dates.

[c]Average for 59 days on which there were prices for both types of buyers.

Types of Sales

Some growers were dissatisfied with prices they received for watermelons sold on consignment. They openly expressed the opinion that many receivers were dishonest. Often buyers required that sales be made on a delivered basis. Many growers did not like to make this type of sale. They preferred, in most cases, to sell f.o.b.

A comparison was made of shipping-point prices the handlers received for f.o.b., delivered, and consigned sales. The prices were determined by averaging the daily prices for each type of sale. The individual daily prices were included only when there was a price for all three types of sales for that day. Table 48 shows the average prices received by type of sale. These prices fit the pattern that one would expect. Since there is more risk involved in delivered sales, it is natural to expect their average shipping-point price to be higher than for f.o.b. sales. The nine cents a hundredweight difference may be thought of as a payment for risk, since transportation costs were first deducted. The low average price for consigned sales should be expected since it is characteristic of handlers to consign watermelons when they are dissatisfied with alternative methods of sale. However, this is not the only time they were handled in this

TABLE 48.--Average shipping-point price of watermelons by type of buyer and type of sale, Florida, 1960[a]

Item	Average of Daily Prices[b] (Cents per Pound)
Type of Buyer:	
Chain stores	2.42
Jobbers	2.45
Type of Sale:	
Delivered	1.73
F.o.b.	1.64
Consigned	1.15

[a]Source: Watermelon handlers' invoices.

[b]Prices are the average of daily prices in which there were prices for each category in the group involved. Therefore, it is to be expected that the prices may differ from one group to another.

manner. One of the larger growers consigned most of his watermelons to one receiver. He seemed satisfied with the arrangement.

Delivered sales had an average of 11.5 cents per hundredweight adjustment allowance which sellers made to buyers. The f.o.b. sales had an average of 7.3 cents per hundredweight adjustment. The higher rate of adjustment for delivered sales reflects the higher risk that is normally

involved. However, there was a difference of nine cents per hundredweight between the price of f.o.b. sales and delivered sales and a difference of only 4.2 cents per hundredweight in adjustments. The net effect was that delivered sales had a price advantage of 4.8 cents over f.o.b. sales. Due to the nature of consigned sales, no adjustments were made in them.

Table 49 gives daily prices used in computing average prices for different types of sale. When only two prices, f.o.b. and delivered, were compared there were 58 dates which had a price for both types of sale. The result of this comparison gave a shipping-point price for delivered sales of $2.47 per hundredweight and an f.o.b. price of $2.39. This is almost the same difference as that shown in Table 48, which was computed from only 24 daily prices because these were all the dates with prices for delivered, f.o.b., and consigned sales.

Factors Which Individual Farmers Cannot Influence

Under conditions of competition, as found in the watermelon market, the general price level is determined by supply of and demand for the commodity. Sellers acting individually can do little to alter these conditions because they are industry-wide. However, some supply and demand

TABLE 49.--Price received for watermelons by type of sale and date, Florida, 1960

Date		Type of Sale			
		Delivered	F.o.b.	Consigned	Joint Account
		Daily Shipping-Point Price (Cents per Pound)			
May	2	6.7	7.2	. .	. .
	3	. .	6.7[a]	. .	. .
	4	. .	. .	. .	. .
	5	5.8[a]	. .	. .	. .
	6	6.0	5.8	. .	. .
	7	5.6	5.8	. .	. .
	8	5.6[a]	. .	. .	. .
	9	5.8[a]	. .	. .	. .
	10	5.2	5.2	. .	. .
	11	. .	5.2[a]	. .	. .
	12	5.2[a]	. .	. .	. .
	13	5.1[a]	. .	. .	. .
	14	4.4	4.6	. .	. .
	15	4.1[a]	. .	. .	. .
	16	4.3	4.5	. .	. .
	17	3.8	4.2	. .	. .
	18	4.0	3.8	. .	. .
	19	3.9	4.0	. .	. .
	20	3.9	3.7	. .	. .
	21	4.1[b]	3.5[b]	3.2[b]	. .
	22	3.8	3.2	. .	. .
	23	3.5	3.1	. .	. .
	24	3.1[b]	3.0[b]	2.3[b]	. .
	25	3.1	2.8	. .	. .
	26	2.8	3.0	. .	. .
	27	3.5	3.0	. .	. .
	28	3.0	3.0	. .	. .
	29	3.0	3.0	. .	. .
	30	3.5	3.0	. .	. .
	31	3.0[b]	3.2[b]	2.4[b]	. .
June	1	3.2	2.8	. .	. .
	2	3.4[b]	2.6[b]	2.3[b]	3.0

TABLE 49.--Continued

Date	Type of Sale			
	Delivered	F.o.b.	Consigned	Joint Account
	Daily Shipping-Point Price (Cents per Pound)			
June 3	2.9	3.0	. .	3.1
4	3.0	2.7	. .	. .
5	3.1	2.9	. .	2.8
6	2.9	2.6	. .	. .
7	2.6[b]	2.3[b]	2.4[b]	. .
8	2.2[b]	2.3[b]	2.2[b]	. .
9	2.3	2.2	. .	2.7
10	2.2[b]	2.2[b]	1.2[b]	2.4
11	2.1[b]	2.1[b]	.1[b]	2.3
12	1.8	1.9	. .	1.4
13	1.8[b]	1.6[b]	1.0[b]	. .
14	1.5[b]	1.3[b]	1.2[b]	1.2
15	1.2[b]	1.4[b]	.8[b]	. .
16	1.2	1.2	. .	. .
17	1.2	1.2	. .	. .
18	1.4[b]	1.2[b]	.9[b]	. .
19	1.3[b]	1.2[b]	.8[b]	. .
20	1.3[b]	1.1[b]	1.0[b]	.8
21	1.1	1.1	. .	. .
22	1.2[b]	1.1[b]	.5[b]	.6
23	1.0[b]	1.2[b]	.8[b]	. .
24	1.2[b]	1.2[b]	.9[b]	. .
25	1.0[b]	1.1[b]	.5[b]	. .
26	1.0[b]	1.0[b]	.8[b]	. .
27	.9	.8	. .	. .
28	1.1[b]	.9[b]	.6[b]	. .
29	.6	.8	. .	. .
30	1.0[b]	1.0[b]	.3[b]	. .
July 1	1.1[b]	1.0[b]	.6[b]	. .
2	. .	1.1[a]	. .	. .
3	.9	.8	. .	. .
4	1.1[a]	. .	. .	. .
5	.9[b]	.9[b]	.5[b]	. .

TABLE 49.--Continued

Date	Type of Sale			
	Delivered	F.o.b.	Consigned	Joint Account
	Daily Shipping-Point Price (Cents per Pound)			
July 6	1.0	.9	. .	. .
7	.9[b]	1.0[b]	.2[b]	. .
8	.8[a]	. .	.6	. .
9	.9	.7	. .	. .
10	. .	. .	. .	. .
11	.6[a]	. .	. .	. .
12	.5	.6	. .	. .
13	. .	.6[a]	. .	. .
Average Price[c]	2.47	2.39	. .	. .
Average Price[d]	1.73	1.64	1.15	. .

[a]These prices were not used in calculating average prices in footnote c because there were no prices for the other types of sales on these dates.

[b]These were the only daily prices used in calculating the average prices in footnote d because they were the only dates that had prices for all three types of sales.

[c]Fifty-eight daily prices were used in determining these averages (see footnote a).

[d]Twenty-four daily prices were used in determining these averages (see footnote b).

conditions can be changed through group action. Thus, it is important to consider the effect that specific supply and demand factors have on the price of watermelons.

Short-Run

There is no single supply factor that one could reasonably expect to account for all the effect of supply on price. However, during the marketing season, terminal market supplies, as reflected by track holdings and unloads, would probably be the most important consideration. Assuming no imperfections in the marketing system, the farm price of watermelons would be the retail price less marketing costs. However, there is no uniform retail price in any market area. There usually is a fairly well established wholesale price. Shipping-point prices generally are terminal market wholesale prices minus shipping and other marketing costs. Sellers generally accept the prices that have been discovered by terminal market wholesale buyers. This is due largely to the concentration of buying power in the hands of relatively few buyers and to the large number of sellers.

A second supply factor that could have some influence on the farm price of Florida watermelons is Florida

shipments. Although the major supply effect would probably be terminal market supplies, because it appears that is where price is established, Florida shipments during a certain period should influence expectations as to future terminal supplies.

Shipments from areas other than Florida are a minor factor during most of the Florida season. Therefore, this would not be expected to have any significant effect upon price.

Watermelons are seasonal in both production and consumption. They are usually associated with warm weather. Thus, it would seem reasonable to expect demand for watermelons to vary directly with temperature.

In order to test the effect of the various factors listed above on the price of Florida watermelons, data on week-to-week variations in Florida price, Florida shipments, terminal supplies, and terminal market temperatures as shown in Table 50 were analyzed to determine the effect of each individual factor on price. When these seasonal data were plotted on graph paper, the resulting pattern was similar to a typical demand function of the type $Y = ax^b$ where a and b are constants, Y is the dependent variable, and x is the independent variable. The demand function may be transformed

TABLE 50.--Average daily carlot equivalent of Florida watermelon shipments and terminal market supplies, terminal market temperature, and Florida price, 1960 season[a]

Week	Florida Shipments (Carlot Equivs.)	Terminal Supplies[b] (Carlot Equivs.)	Terminal Temperatures[c] (Degrees F)	Florida Prices[d] (Cents per Cwt.)
May 2 - 8	37	96	67	527
9 - 15	75	202	70	464
16 - 22	187	274	64	316
23 - 29	198	519	76	244
30 - June 5	296	503	76	235
June 6 - 12	427	622	79	143
13 - 19	650	841	77	50
20 - 26	720	1,280	79	32
27 - July 3	324	1,696	80	22
July 4 - 10	119	1,484	82	21

[a]Source: Federal-State Market News Service, Watermelon Report, Nos. 1-49 (Plant City, Florida, and Thomasville, Georgia, May 2-July 11, 1960).

[b]Terminal supplies include "on track and arrivals" and unloads as reported by Federal-State Market News Service.

[c]Average of the daily maximum temperatures as reported from 13 major cities. Temperature is lagged one week.

[d]Expressed on the basis of on-the-vine prices.

into a linear form by converting the data to logarithms. This linear form is log Y = log a + b log x. Expressed in this manner the coefficient of the independent variable is the estimated coefficient of price flexibility. Logarithms deal in relative values (percentages), while analysis without the use of logarithms gives coefficients in terms of absolute values. Regressions using logarithms minimize the sum of the percentage errors, squared, instead of the sum of the absolute errors, squared. Demand curves are thought of as relative relationships. Therefore, the transformation to logarithms permits one to read the coefficients of estimated price flexibility directly from the solution and to calculate an estimate of the elasticity of demand.

The transformed data were plotted against time. Handled in this manner the data showed a relationship between Florida shipments and terminal supplies until the last two weeks of the Florida season. The effect of Florida shipments in the last two weeks apparently nullified the expected relationship between Florida price and Florida shipments. Terminal temperatures showed little relative change from week to week and therefore appeared to be of minor importance in determining the price of Florida watermelons.

Results of Analysis

In order to determine the accuracy of the apparent relationships between Florida price and the independent variables, a statistical model of the following form was tested.[2]

$$Y_{ijkl} = B_0 + b_1X_{i1} + b_2X_{j2} + b_3X_{k3} + e_{ijkl}$$

where

Y_{ijkl} = logarithm of the Florida price for the ith terminal supply, the jth terminal temperature, the kth Florida shipment, and the lth random disturbance.

B = general regression constant.

X_{i1} = logarithm of terminal supply.

X_{j2} = logarithm of terminal temperature.

X_{k3} = logarithm of Florida shipment.

e_{ijkl} = random disturbance.

b_1 = price flexibility with respect to terminal supply.

b_2 = price flexibility with respect to terminal temperature.[3]

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[2]Capital letters are used for logarithms of the variables.

[3]X_2, the logarithm of terminal temperature, was coded, which in turn coded the b value. However, this had no effect on the t ratio or the test of significance since the b is nonsignificant.

b_3 = price flexibility with respect to Florida supply.

The above model was fitted to the seasonal data.[4] Equation 1 gives the coefficients for the three independent variables. Equation 2 gives the coefficients for the variables of terminal supply and temperature. Equation 3 gives the coefficients for the variables of terminal supply and Florida shipments. Equation 4 gives the coefficient for the variable of terminal supply. The equations are as follows:[5]

Equation (1): $\hat{Y} = B_0 - \underset{(0.44175)}{1.65841X_1} + \underset{(0.41595)}{0.19320X_2} + \underset{(0.25926)}{0.31357X_3}$

R^2 0.896

Equation (2): $\hat{Y} = B_0 - \underset{(0.37683)}{1.35795X_1} + \underset{(0.42210)}{0.10473X_2}$

R^2 0.871

Equation (3): $\hat{Y} = B_0 - \underset{(0.24848)}{1.49286X_1} + \underset{(0.24310)}{0.29250X_3}$

R^2 0.892

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[4]Computations are shown in Appendix E.

[5]The data in parentheses are the standard deviations of the b's above. R^2 is the proportion of the deviations of the dependent variable which is explained by the independent variable.

Equation (4): $\hat{Y} = B_0 - \underset{(0.49950)}{1.27665X_1}$

R^2 0.870

where

$\hat{Y}$ is the logarithm of Florida on-the-vine price of watermelons in cents per hundredweight.

X_1 is the logarithm of terminal supplies of all watermelons in carlot equivalents.

X_2 is the logarithm of the average of the daily maximum temperatures as reported from 13 major cities, lagged one week.

X_3 is the logarithm of Florida shipments of watermelons in carlot equivalents.

The three independent variables in equation 1 explain 89.6 percent of the price variability during the Florida watermelon marketing season. The standard errors of the coefficients of terminal market temperature (X_2) and Florida shipments (X_3) are so large in relation to their respective b's as to be of insignificant value in determining price. The same relationships are apparent for X_2 in equation 3 when estimated in this sequential manner. Equation 4 shows that terminal market supplies (X_1) was the only reliable independent variable in determining the price of Florida watermelons during the 1960 season, accounting for 87 percent of the variation in Florida prices.

Using equation 4, it was determined that the price flexibility of Florida watermelons during the season was -1.28. This indicates that as the terminal supplies of watermelons changes by 1 percent, the price of Florida watermelons changes by 1.28 percent in the opposite direction. This gives an estimate of price elasticity of demand for watermelons of -.78 during the 1960 Florida marketing season.

Long-Run

For year-to-year price variations one would expect supply of and demand for watermelons on a yearly basis to determine price. Since Florida is the major source of supply during the Florida shipping season, this is the supply factor one would expect to have the greatest effect on price. Supplies from other sources make up a substantial volume during some seasons. Thus, it seems reasonable to expect that they would also affect Florida price.

Terminal market temperature was included as a variable for long-run analysis because of the significance attached to it by Fowler and Klein.[6]

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[6]Fowler and Klein, loc. cit.

Changes in consumers' tastes and buying habits over a period of years may be expected to change the demand for watermelons over time. Thus, time should be considered a factor affecting price.

The purpose of this section was to determine the effect certain supply and demand factors had on the price of watermelons from year to year. Data used in this analysis were from the 1951 season through 1960 (Table 51). Data were limited to these 10 seasons to eliminate, as much as possible, changes in demand over time which might involve variables that could not be isolated, such as the Korean War in 1950, the depression of 1949, the rapid period of inflation following World War II, and World War II itself.

Results of Analysis

Data for the period 1951 to 1960 were transformed to logarithms for the reasons outlined in the previous section on short-run analysis. Plotting the logarithmic data revealed no direct relationships with price except for the fact that terminal market temperature, while fluctuating within a very narrow range, varied directly with the changes in the season average price of watermelons.

To determine the quantitative relationships between Florida price and the independent variables, a statistical

TABLE 51.--Florida watermelon supply, other watermelon supply, disposable income, terminal market temperature, and Florida watermelon price for the seasons 1951-60

Year	Florida Supply[a]	Other Supply[b]	Disposable Income[c]
	(Pounds per 1,000 U.S. Population)		(Dollars per Capita)
1951	2,936	2,046	1,313
1952	3,513	1,713	1,312
1953	4,347	2,355	1,367
1954	4,647	4,043	1,362
1955	4,391	3,134	1,428
1956	4,897	2,189	1,466
1957	3,793	1,362	1,468
1958	4,470	1,528	1,460
1959	2,774	2,539	1,526
1960	4,044	1,984	1,558
Average	3,981	2,289	1,426

[a]Source: Annual Agricultural Statistical Summary, 1959-60 Season (Jacksonville, Florida: Florida State Marketing Bureau, November, 1960), p. 96.

[b]Includes only the shipments during the Florida season. Source: Donald L. Brooke, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Mimeo Reports 58-4, 59-3, 60-3, and 61-3, 1957-60), C. V. Noble, Marvin A. Brooker, and Donald L. Brooke, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Series Nos. 54-4, 55-2, 56-1, and 57-2, 1953-56), and C. V. Noble and Marvin A. Brooker, Florida Truck Crop Competition 1. Interstate and Foreign (Gainesville, Florida: Florida Agricultural Experiment Station Series No. 52-8, 1951-52).

[c]As of June of each year adjusted to constant dollar value by use of the United States Department of Labor index of wholesale prices for all commodities, 1947-49 = 100.

TABLE 51.--Extension

Time Factor	Terminal Market Temperature[d]	Florida Price[e]
	(Degrees F.)	(Cents per Cwt.)
1	76.8	117
2	78.1	146
3	78.7	118
4	75.6	70
5	77.1	131
6	76.8	108
7	77.0	129
8	74.4	40
9	78.8	149
10	75.0	59
	76.8	107

Source: U.S. Department of Commerce, Survey of Current Business, Vols. 32-41, No. 8 (1951-60).

[d]Average daily high for May and June of each year. Includes the following cities: Atlanta, Boston, Chicago, Columbus (Ohio), Cleveland, Detroit, Kansas City, Minneapolis, New York, Pittsburgh, Buffalo, Philadelphia, St. Louis, and Baltimore. Source: U.S. Weather Bureau, Climatological Data, National Summary, Vols. 2-11, Nos. 5-6 (1951-60).

[e]On-the-vine price adjusted to constant dollar value, 1947-49 = 100. Harvesting and selling costs subtracted from shipping-point price. Source: Annual Agricultural Statistical Summary, 1959-60 Season, op. cit.

model of the following form was tested.

$$Y_{ijklmn} = B_0 + b_1X_{i1} + b_2X_{j2} + b_3X_{k3} + b_4X_{14} + b_5X_{m5} + e_{ijklmn}$$

where

Y_{ijklmn} = the logarithm of Florida price for the ith Florida supply, the jth time period (year), the kth terminal temperature, the lth other supply, the mth disposable income, and the nth random disturbance.

B_0 = general regression constant.

X_{i1} = logarithm of Florida supply.

X_{j2} = logarithm of time.

X_{k3} = logarithm of the terminal temperature.

X_{14} = logarithm of other supply.

X_{m5} = logarithm of disposable income.

e_{ijklmn} = random disturbance (error).

b_1 = price flexibility with respect to Florida supply.

b_2 = price flexibility with respect to time.

b_3 = price flexibility with respect to terminal temperature.

b_4 = price flexibility with respect to other supply.

b_5 = price flexibility with respect to disposable income.

The above model was fitted to the annual data.[7] Equation 5 gives the coefficients for the first five independent variables, Florida supply, time, terminal temperature, other supply, and disposable income. Equation 6 eliminated the coefficient for other supply from equation 5. Equation 7 eliminated the effect of disposable income from equation 6. Equation 8 eliminated the effect of Florida supply from equation 7. Equation 9 eliminated the effect of time from equation 8. In equation 10, Florida supply and other supply were combined to give total terminal supply. The equations are as follows:

Equation (5): $$\hat{Y} = B_0 - \underset{(0.56570)}{0.15748X_1} - \underset{(0.14350)}{0.04928X_2} + \underset{(5.55327)}{18.96930X_3} + \underset{(0.29434)}{0.00212X_4} - \underset{(1.70339)}{0.17078X_5}$$

R^2 0.83

Equation (6): $$\hat{Y} = B_0 - \underset{(0.48563)}{0.16026X_1} - \underset{(0.12808)}{0.04984X_2} + \underset{(4.88643)}{18.87647X_3} - \underset{(1.51854)}{0.17177X_5}$$

R^2 0.83

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[7] Computations are shown in Appendix F.

Equation (7): $\hat{Y} = B_0 - \underset{(0.44067)}{0.14970X_1} - \underset{(1.12085)}{0.05469X_2} + \underset{(4.38427)}{19.08163X_3}$

R^2 0.83

Equation (8): $\hat{Y} = B_0 - \underset{(0.0989)}{0.06132X_2} + \underset{(3.73206)}{19.77586X_3}$

R^2 0.83

Equation (9): $\hat{Y} = B_0 + \underset{(3.40261)}{20.51562X_3}$

R^2 0.82

Equation (10): $\hat{Y} = B_0 - \underset{(0.80131)}{0.66593X_6}$

R^2 0.08

where

$\hat{Y}$ = the logarithm of the Florida season average on-the-vine price of watermelons in cents per hundredweight.

X_1 = the logarithm of Florida supply of watermelons in carlot equivalents.

X_2 = the logarithm of time in years from 1950.

X_3 = the logarithm of average daily high terminal temperature for the May and June of each year.

X_4 = the logarithm of other supply during the Florida shipping season.

X_5 = the logarithm of the index of disposable income as of June of each year adjusted to constant dollar value by use of the United States Department of Labor index of wholesale prices for all commodities, 1947-49 = 100.

X_6 = the logarithm of total terminal supply of watermelons during the Florida shipping season (Florida supply plus other supply, $X_1 + X_4$ above).

The five independent variables in equation 5 explain 83 percent of the price variability from year to year. However, only one coefficient of the five independent variables was larger than its standard error, terminal temperature. Following through equations 6 through 9 in a sequential manner the same relationship held. In equation 10, the total terminal supply explained only 8 percent of the variability, the standard error being larger than the b. Therefore, the only statistically significant coefficient in equations 5 through 10 is the coefficient for terminal temperature, which explained 82 percent of the year-to-year price variation.

In equation 9 the price flexibility with respect to terminal temperature is 20.52. In other words, if the average high seasonal terminal temperature changes by 1 percent, the season average price of Florida watermelons changes by 20.5 percent in the same direction for the period 1951 to 1960.[8]

It was explained earlier that the period 1951 to 1960 was chosen because of the presence of extraneous factors

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[8]See further discussion at end of chapter.

for which no measurement was available during years prior to 1951. This left only ten years of data available for estimating the coefficients. In equation 9 there are only four degrees of freedom for the error term, which would tend to give statistically nonsignificant and unreliable coefficients. Since neither Florida supply, other supply, or the combination of the two was statistically significant when used alone or in combination with the other variables, there were probably other extraneous and confounding factors operating during this relatively short period of time; hence, the lack of any measurable significance between the factors of supply and price.

This section has been included for its methodological value, since this is an approach which may be used in estimating long-run relationships between price and quantities if reliable data were available over a sufficient length of time to produce meaningful results.

Further observations of Table 51 disclosed that the years of highest terminal market supplies were not always the years of lowest season average prices in Florida. Tabulation of terminal supplies (Table 52) during the major portion of the Florida season indicated:

1. Lowest prices occurred in seasons when the weekly terminal supplies exceeded 5,000 cars for two or more con-

TABLE 52.--Seasonal distribution of terminal market supplies of watermelons during the Florida season, by weeks, May to July, 1951-60[a]

Weeks	Seasons			
	1951	1952	1953	1954
Carlot Equivalents:				
1	52	84	1,119	566
2	101	458	1,795	1,280
3	361	715	1,511	2,743
4	1,552	1,521	2,026	3,730
5	2,132	2,387	4,415	5,738
6	3,516	3,737	3,539	6,585
7	3,564	4,844	5,337	6,925
8	4,103	4,540	4,070	5,621
9	4,317	4,679	5,077	3,105
10	3,212	2,548	2,312	2,796
11	3,306	2,978	1,856	1,915
12	2,330	1,996	2,055	1,333
13	1,894	. .	. .	. .
Total	30,440	30,487	35,112	42,337
Percent of Total:				
1	.2	.3	3.2	1.3
2	.3	1.5	5.1	3.0
3	1.2	2.3	4.3	6.5
4	5.1	5.0	5.8	8.8
5	7.0	7.8	12.5	13.6
6	11.5	12.3	10.1	15.6
7	11.7	15.9	15.2	16.4
8	13.5	14.9	11.6	13.3
9	14.2	15.3	14.5	7.3
10	10.5	8.4	6.6	6.6
11	10.9	9.8	5.3	4.5
12	7.7	6.5	5.8	3.1
13	6.2	. .	. .	. .
Total	100.0	100.0	100.0	100.0

[a]See Table 51, footnote b.

TABLE 52.--Extension

Seasons					
1955	1956	1957	1958	1959	1960
621	1,080	559	. .	1,167	386
1,478	1,482	1,025	. .	1,758	601
1,572	1,599	1,963	183	1,251	1,214
3,290	3,163	2,548	227	2,729	1,749
4,173	3,273	2,906	915	3,377	2,043
3,374	4,002	3,443	2,376	2,802	3,421
2,876	6,164	4,823	5,743	3,191	5,056
6,486	5,876	5,663	6,291	4,334	6,034
5,277	4,376	3,132	6,970	3,422	4,528
5,157	3,195	981	4,812	1,350	2,291
3,098	1,635	1,526	3,662	670	1,533
. .	1,328	1,697	953	400	450
. .	. .	673	645	433	465
37,402	37,173	30,339	32,777	26,884	29,791
1.7	2.9	1.8	. .	4.3	1.3
3.9	4.0	3.4	. .	6.5	2.0
4.2	4.3	6.5	.5	4.7	4.1
8.8	8.5	8.4	.7	10.2	5.9
11.2	8.8	9.6	2.8	12.6	6.8
9.0	10.7	11.4	7.2	10.4	11.5
9.7	16.6	15.9	17.5	11.9	17.0
17.3	15.8	18.7	19.2	16.1	20.2
14.1	11.8	10.3	21.3	12.7	15.2
13.8	8.6	3.2	14.7	5.0	7.7
8.3	4.4	5.0	11.2	2.5	5.2
. .	3.6	3.6	2.9	1.5	1.5
. .	. .	2.2	2.0	1.6	1.6
100.0	100.0	100.0	100.0	100.0	100.0

secutive weeks during the Florida season. Apparently a large supply on the market during a short period of time depresses prices to a greater extent than the same total supply more normally distributed.

2. The years of low prices are the years of below average temperature in the terminal markets. These are also the years of late frosts or poor growing weather in Florida, resulting in a late shipping season. Low temperatures and low prices are apparently coincidental; a late spring in the southeastern United States not only results in an abnormal supply distribution but seems to be associated with lower than normal terminal market temperatures during the Florida shipping season.

CHAPTER IV

AN EVALUATION OF VARIOUS MARKETING PROGRAMS

Conditions of the Watermelon Industry

Before any marketing program is suggested, it seems desirable to review the general conditions of the Florida watermelon industry.

Supply Conditions

Supply control is an important consideration in any watermelon marketing program. Growers, itinerant truckers, and handlers thought oversupply was a major problem. This is an area in which all segments of the industry were in substantial agreement.

The problem of supply is more than one of total annual volume. Timing of production and harvesting is also of great importance because of the perishable nature of the product. To prevent overripening, watermelons must be harvested and placed in market channels within a few days after maturity. The opportunity for holding melons off the market, to be sold later, is severely limited. Thus, a large annual

Florida production could be sold for a reasonable price if harvesting were properly spread out over the season. However, weather sometimes prevents this. If a large proportion of the crop is harvested over a relatively short period, a small total annual volume may sell for a relatively low price.

Quality Conditions

Poor quality and immature watermelons were of great concern to all segments of the industry. The general feeling was that poor quality watermelons affected price by competing with good produce in two ways. They add to the total market supply. Since they sell for a lower price than better quality watermelons, they tend to depress the price out of proportion to the quantity involved. It was also the opinion of many in the industry that poor quality and green watermelons on the market cause dissatisfied customers and consequently a decline in future purchases.

Large Number of Sellers

The 1959 Census of Agriculture shows that watermelons were produced on 1,917 farms. Except for a few farmers who were financed by someone else, each producer assumed the

responsibility for selling his own crop (since 1960 two local cooperatives have been organized to sell watermelons). Under such conditions the selling side of the market approached pure competition, except for one major factor--the growers' knowledge of market conditions was far from complete.

While there are many watermelon buyers, buying is concentrated in fewer hands than is selling. Since buyers are in close contact with terminal markets, they have better knowledge than sellers of current market conditions. As a result, growers feel that they are in no position to bargain.

Individualism among Growers

Growers' responses to interview questions indicated a high degree of individualism among them. There appeared to be a strong desire by many to go their own way in marketing their produce. Before orderly marketing can be accomplished, more cooperation among growers must be achieved. Better knowledge of what marketing programs can accomplish, and their limitations, should lead to a greater willingness of growers to undertake marketing programs which require cooperation.

Marketing Programs

Since the supply of a commodity and the demand for it determine its price, any consideration of a marketing program should be concentrated in these areas. One objective could be to manage supply to achieve a long-run price structure favorable to producers. A second objective could be to increase demand for watermelons so any given supply could be disposed of more profitably.

To achieve its greatest effectiveness, any marketing program would need to combine a number of activities. Since both production and marketing of watermelons are in the hands of many individuals, any successful program would be dependent upon group actions.

A watermelon marketing program with the greatest chance of success would probably include many of the activities permitted under marketing orders in conjunction with cooperative marketing associations.

Marketing Orders

Supply control, quality control, and standardization of grades are activities that can be carried out under a federal marketing order which could be helpful in achieving higher returns to watermelon growers. Advertising and

promotion also are activities that could be helpful. Although these latter programs cannot be carried on under present marketing order legislation, future enabling laws may permit such action under state orders.

Supply Management

Supply management could be approached in three different ways: (1) supply control through quality restrictions, (2) individual producer marketing quotas, and (3) flow to market regulations during the marketing season. As has been indicated in Chapter III, terminal market supply during the season had a significant effect on the farm price of watermelons. Since Florida is the principal shipper of watermelons through June, control of shipments from this source would directly affect the volume on terminal markets. Therefore, price could be manipulated through control of shipments from Florida until about the third week in June.

Control of supply through quality restrictions would give no long-term advantage in price. Any price which gave to producers more than a reasonable return for all factors of production would cause an increase in production to the point where returns for factors used in watermelon production would be comparable to returns for factors used in other

types of production with similar risks. Thus, supply control by use of quality restrictions would be effective in increasing price on a short-term basis only.

Individual producer marketing quotas would restrict the total shipment from the marketing area on a seasonal basis. This could be effective in increasing the price of watermelons for one season or for a longer period of time. By means of a marketing order this type of regulation could be used to place producers with quotas in a monopoly position. Therefore, they could conceivably obtain a price, over the long run, significantly higher than the cost of production. However, the use of quotas would be less effective for producers in the northern section of the state than for those in South Florida because of competition from production areas in other states.

Flow to market regulations during a season could be used to restrict shipments at times of depressed prices. When used by itself this method of supply control would have economic implication similar to those of quantity control by grade and size. However, it could be used as an effective supplement to a program of seasonal quotas. Such a combination would limit total seasonal supply and prevent periods of excessive shipments.

Any long-run program of supply restriction would involve the danger of reducing the relative position of watermelons in the produce market. With an abnormally high price for the commodity for an extended period, consumers would probably substitute other produce and thereby cause a change in buying habits. Thus, any program of supply restriction should be viewed with caution. However, restriction of supplies on a temporary basis could prove to be a desirable alternative to an extremely depressed market condition.

Quality Control

A program of quality control would go hand-in-hand with a supply control program which used grade and size restrictions. Although supply control should be used only as a short-term emergency measure, quality control could be useful on a continuing basis. Quality control would not only help the market during an emergency by decreasing the supply on the market, but could also be beneficial in the long run. The opinion is widespread among those in the watermelon industry that poor quality causes dissatisfied consumers, thereby decreasing long-run demand.

Sizes could also be regulated as a means of quality control. The opinion is prevalent that Charleston Grey

watermelons smaller than about 16 pounds are of inferior cutting quality and should be kept off the market.

If quality control proved effective in increasing the demand for watermelons and thereby increasing price above the long-run cost of production, one would expect an increase in production. This would cause a decline in price which, in the long run, would approach cost of production. The result would probably be that more watermelons would be sold with quality control than without. The price should settle near the cost of production.

Standardize Grades

Since watermelons are shipped in trucks or rail cars without packaging and are sized on the basis of their weight, there is no need for any size and pack standardization. However, a marketing order could be effective in standardizing as to grades of watermelons that go to market. In recent years the major portion of the crop has been sold without government inspection (Table 38). As a consequence there has been no uniform standard of quality for these watermelons. Quality standards aid orderly marketing by helping to prevent misunderstanding and disputes.

Advertising and Promotion

It is difficult to measure the influence of advertising and promotion. However, these activities are generally accepted by those in the field of marketing as being effective in increasing demand for the products involved.

If advertising and promotion proved effective in increasing the price of watermelons, an increase in production would result. This increase in volume would tend to depress prices. To maintain prices at a level higher than that previous to initiating the program, a constantly increasing amount of money would have to be used in advertising and promotion.

It appears that a long-run effect of this type of program would be that more watermelons could be sold without any significant change in price if there were no restrictions on the volume that could be sold. However, if marketing quotas were established under a marketing order, advertising and promotion might be effective in increasing price above cost of production on a long-run basis. One would expect the net effect to be an increase in demand. As a result, more watermelons could be sold at a constant price or a constant volume could be sold for a higher price.

Cooperative Marketing Associations

A marketing order would not solve some of the major watermelon marketing problems. It would not directly change the relative bargaining position between buyers and sellers. Neither would it directly improve growers' knowledge of market conditions.

Cooperative action by growers could assist in solving these problems and others. More orderly marketing could be accomplished, experienced salesmen could be utilized, and advertising and promotion could be carried on.

Bargaining Power and Market Information

Greatest bargaining power could be accomplished by one industry-wide organization. But it is unlikely that such an organization could be established because of the attitude of growers. A number of local cooperatives could be effective in attaining a high degree of bargaining power. Those responsible for selling would also be well informed on the latest market conditions. The degree of effectiveness of local cooperatives would depend upon the proportion of growers organized and the extent to which the associations followed a common policy.

Watermelons are not shipped from all sections of Florida at the same time; generally they are marketed from the various production areas in successive periods. Cooperatives organized on a production-area basis should approach the effectiveness of one state-wide association.

It should not be expected that cooperatives could be effective in obtaining artificially high prices. They could assist in eliminating some of the imperfections of the marketing system and thereby placing growers in a more favorable position in selling their watermelons.

Orderly Marketing

The concentration of sales in one or a few organizations could contribute greatly to orderly marketing. There would be better knowledge of future supplies and it would be easier to restrict supplies in times of heavy shipments and low prices. Grades could be standardized and the poor quality watermelons not sold. Buyers could buy with greater confidence because there would be less chance of drastic price decline due to heavy supply or poor quality.

The cooperatives could hire competent personnel to handle the sales or they could contract for one or more sales agencies to do the job. In either case, the sales force would have better knowledge of the latest market

conditions than would most farmers. They would have contacts with the terminal market--a necessity for doing a good job of selling. They would also be experienced in dealing with the terminal market buyer and would therefore be in a better position than farmers to arrive at a favorable price which would more nearly reflect the supply and demand situation.

Advertising and Promotion

It would not be feasible to undertake an advertising and promotion program on a commodity basis without the support of substantially all of the industry. However, cooperatives could be the driving force in obtaining such an industry-wide program.

CHAPTER V

SUMMARY AND CONCLUSIONS

Over the past 10 years, Florida farmers have produced approximately 22 percent of the total United States volume of watermelons. From the middle of April until the middle of June, the weekly supply from Florida accounts for more than two-thirds of the total national market volume. The different climatic conditions in the state permit watermelon shipments to begin in April and continue into July. Under normal weather conditions the harvest season progresses from South Florida to the West Florida panhandle section in an orderly fashion with some overlapping of harvest dates.

Method of Procedure

To determine the watermelon market organization, data were obtained by personal interview from growers, itinerant truckers, and handlers. This information was tabulated and analyzed by the tabular method.

To determine the effect of various factors on the price of watermelons, data were obtained from handlers' sales

records and from published sources. Part of these data were analyzed by tabular method and part by the least squares method of multiple regression.

Organization of the Watermelon Market

For the purpose of this study, the watermelon market organization was divided into three distinct groups of individuals: (1) growers, (2) itinerant truckers, and (3) established watermelon handlers.

Growers

The acreage of watermelons produced per grower varied from five to 600 acres for those interviewed. Economic abandonment was important to growers during 1960. Central Florida producers had the highest rate of abandonment, while those from South Florida had the least.

Small growers sold largely to itinerant truckers who loaded at or near the watermelon fields. For the greater part, their sales were on an individual basis. The larger growers sold primarily through brokers with rail the most often used type of transportation. Sales were made principally on the basis of making arrangements before harvest for a broker to handle the entire crop. Medium-size growers

sold primarily to established buyers on an individual load basis. They used both field and central loading points extensively.

The method used in determining the sale price of watermelons depended upon the market situation at the time of sale. When price was high, with a strong sellers' market, growers bargained extensively with buyers in an effort to obtain as high a price as possible for their watermelons. Under depressed market conditions, growers were more prone to accept the first offer made by a buyer.

Itinerant Truckers

Itinerant truckers represent an important segment of the watermelon market structure. Although they handle only about 10 percent of the total volume of Florida watermelons, the belief is widespread among those in the industry that their effect on the market is greater than their volume would indicate. The belief is that they depress the price by handling off-grade watermelons and by paying low prices to small growers.

Watermelon Handlers

Handlers represent one segment of the Florida watermelon industry which has some semblance of order. They ranged in size of operation from 40 to nearly 2,000 carlots handled per season.

Handlers, on the average, bought 61 percent of the watermelons they sold. Twenty-one percent were handled on brokerage. The remaining 18 percent were watermelons which they had a financial interest in producing.

Sixty percent of all handler sales were made on a delivered basis, 36 percent f.o.b., and the remaining 4 percent either on a joint account basis or consigned. Small handlers sold largely on a delivered basis while large handlers used both f.o.b. and delivered sales extensively. Fifty-two percent of all handlers' sales went directly to chain stores.

Price Analysis

There did not appear to be any appreciable difference in the prices received by handlers for sales to chains and to other buyers. The average price for chain store sales was 2.42 cents per pound while to jobbers it was 2.45 cents.

Delivered sales returned the highest shipping-point price to handlers while consigned sales returned the lowest. After allowing for adjustments in claims, the delivered sales still had a slight advantage over f.o.b. sales in net price to the handlers.

In the short run, a 1 percent change in terminal market supply resulted in a 1.28 percent change in farm price in the opposite direction. No other variable was statistically significant. The multiple regression coefficient indicated that 87 percent of the price variation was explain by changes in terminal supply.

In the long run, the only factor which showed a statistically significant effect on price was terminal market temperature. It appeared that inadequacies of the data prevented significant coefficients for one or more of the other variables.

Marketing Programs

At the present time a marketing order on Florida watermelons probably could not receive enough support to be implemented. Yet, if those in the industry were made fully aware of its method of operation and potential accomplishments, one probably could be implemented and successfully operated.

Due to different interests, attitudes, and opinions on the part of growers, a state-wide watermelon marketing cooperative association probably could not be organized. But, potentially, one could be very effective in helping to solve the growers' marketing problems. Even though local marketing associations would not have the potentials of a state-wide organization, they have a better chance of being organized. If they were organized on a production-area basis they could be an effective marketing device.

APPENDIX A

Form Used for Grower Survey

FLORIDA AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURAL ECONOMICS

SURVEY OF WATERMELON GROWERS

Time_____ Date_____

1. Name of interviewer:_____
2. Name of grower:_____
3. Mailing address:_____
4. Location of watermelon fields: County_____
5. How many years have you grown watermelons in Florida?_____
6. How many acres of watermelons did you have planted this year?_____
   a. Why didn't you plant more?_____
   _____
   _____
   _____
7. What portion of your good melons did you sell?_____
8. Why didn't you sell all your watermelons? Low price_____Poor quality_____
   Other (specify)_____
   _____
   _____

9. How many watermelons did you sell this year? Carloads_____Carlot Equivalents_____

Semi-trailers_____Bob trucks_____

10. How did you sell your watermelons this year?

	Percentage or Volume
a. In the field in bulk	
b. Individual melons on the vine	
c. Loaded on truck at the field	
d. Loaded on trucks at central loading point	
e. Loaded on railroad cars	
f. Delivered to terminal market	
g. Other (specify)	
100	

IF ANSWER TO 10 IS NEITHER "d" nor "e," SKIP TO QUESTION 12.

11. What local shipping points did you use this year?_____

a. Trucks_____How many miles from your watermelon field?_____

b. Rail_____How many miles from your watermelon field?_____

12. Did you sell your watermelons through a cooperative?

Yes_____No_____

a. What is the name of the cooperative?_____

Address_____

b. What was the cost for selling? $_____per_____

c. What functions besides selling did the cooperative perform?

1. Harvesting_____Cost to you_____

2. Loading_____Cost to you_____

3. Furnish brand name_____Cost to you_____

4. Other (specify)_____

_____

IF ANSWER TO 12 IS "YES," SKIP TO QUESTION 17.

13. Did you sell your watermelons through someone who financed your watermelon production?_____

a. Was there a stipulation in your financial arrangements as to how your watermelons were to be sold?

_____

b. What was the source of your financial backing?

1. Broker_____

2. Shippers_____

3. Banker_____

4. Other grower_____

5. Private individual_____

6. Other (specify)_____

_____

c. Where is your financer's home office?

1. Florida_____

2. New York_____

3. Other (specify)_____

14. Did you have an arrangement for someone else to sell your watermelons last season? Yes_____No_____

a. How did the arrangement work?_____

_____

_____

b. How much did it cost?_____

_____

15. Of your sales, what portion was sold in the following manner?

	Total Sales		What portion of each was inspected?	
	Percent	or Volume	Percent	or Volume
Direct to trucker_____				
Direct to other buyer_____				
Through a broker_____				
Through a shipper_____				
Joint account_____				
Other_____				
100%				

16. Of your direct sales, what portion was sold in the following manner?

Type of Buyer	Total % or Vol.		Inspected % or Vol.		TYPE OF SALE: FOB % or Vol.		TYPE OF SALE: Delivered % or Vol.		METHOD OF PAYMENT: Cash % or Vol.		METHOD OF PAYMENT: Open Account % or Vol.		When Shipment Is Received % or Vol.	
Chains														
Truckers														
Other buyers														
Don't know														
	100													

17. Why did you sell your watermelons the way you did?

a. To truckers_____

_____

b. To chains_____

_____

c. To other buyers (specify type)_____

_____

d. Through broker_____

_____

e. Through shippers_____

_____

f. Other (specify)_____

_____

18. What do you believe would be the best way for you to sell your watermelons?_____

_____

19. Why would you want to sell in this manner?_____

_____

_____

_____

_____

_____

_____

20. How did you get information about the price that watermelons were selling for?

a. Radio_____

b. Newspaper_____

c. Other watermelon growers_____

d. Watermelon buyers_____

e. Others (specify)_____

_____

_____

IF SOLD THROUGH A COOPERATIVE, SKIP TO QUESTION 23.

21. When you made sales direct to buyers, how did you arrive at the price to be paid?

a. Take the highest price the buyer offered_____

b. Set a minimum price acceptable, based on latest available price news_____

c. Bargain for best deal_____

d. Other (specify)_____

_____

_____

22. Did you market your melons under a brand name?

Yes_____No_____

a. What is the brand name? (names)_____

b. Who owns the brand name? (names)_____

Address of owner_____

c. What grade (grades) were branded? US No. 1_____

US No. 2_____Ungraded_____

d. What type of buyers prefer branded melons?

(Indicate order)

1. Chain stores_____

2. Independent retailer_____

3. Others (specify)_____

e. What is the advantage of branding?_____

_____

_____

23. When did you make arrangements for the sale of your melons?

a. Before each load_____

b. Before the harvest season started_____

c. Before planting_____

d. Other (specify)_____

24. How many watermelon buyers other than independent truckers did you sell to?_____

_____

25. Did you lose any sales because you didn't have the kind of watermelons the buyer wanted? Yes___No_____

a. What kind did you have?_____

b. What kind did the buyer want?_____

c. How will this affect next year's plans?_____

_____

_____

26. Did you have any trouble getting rid of any particular type or size of melons? Yes_____No_____

a. Which ones?_____

_____

b. How will this affect your plans for next year?

_____

_____

27. At what time during the season did you sell your watermelons?

Before April 18_____loads Week of June 6_____loads

Week of April 18_____loads Week of June 13_____loads

Week of April 25_____loads Week of June 20_____loads

Week of May 2_____loads Week of June 27_____loads

Week of May 9_____loads Week of July 4_____loads

Week of May 16_____loads Week of July 11_____loads

Week of May 23_____loads Week of July 18_____loads

Week of May 30_____loads After July 18_____loads

a. Date of first load_____Date of last load_____

28. Do you think there should be compulsory inspection for all watermelons shipped out of state?

a. Should: Strong_____Moderate_____Weak_____

b. Should not: Strong_____Moderate_____Weak_____

c. No opinion_____

IF ANSWER TO 28 IS "c," THEN SKIP TO QUESTION 31. IF "b," SKIP TO QUESTION 30.

29. Why do you favor compulsory inspection?

a. More uniform product on the market_____

b. Easier to sell inspected melons_____

c. Would increase returns to grower_____

d. Would reduce disputes with buyers_____

e. Would be easier to get what the melons are worth_____

f. Less chance of buyers taking advantage of growers' ignorance_____

g. Others (specify)_____

_____

_____

30. Why do you oppose compulsory inspection?

a. Too much governmental interference_____

b. Would not be able to sell all my watermelons_____

c. Too much bother_____

d. Would cost too much_____

e. Would help buyers and hurt growers_____

f. Others (specify)_____

_____

_____

_____

IF SOLD THROUGH A COOPERATIVE, SKIP QUESTIONS 31 AND 33.

31. Are you in favor of organizing a cooperative for marketing watermelons?

Yes_____No_____No opinion_____

IF ANSWER TO 31 IS "No opinion" THEN SKIP TO QUESTION 34. IF "No" SKIP TO QUESTION 33.

32. Why do you favor marketing watermelons through a cooperative?

a. Better bargaining position_____

b. Would have specialist to handle selling_____

c. Would cost less to sell watermelons_____

d. Could develop special demand for quality melons___

e. Others (specify)_____

_____

_____

_____

_____

33. Why are you opposed to joining a cooperative for marketing watermelons?

    a. Couldn't sell like I want to_____

    b. Would cost too much_____

    c. Just wouldn't work_____

    d. Others (specify)_____

    _____

    _____

    _____

    _____

34. Are you familiar with the operations of marketing agreements? Yes_____No_____

35. Do you think there should be a marketing agreement for Florida watermelons? Yes_____No_____No opinion_____

    IF ANSWER TO 35 IS "No opinion," THEN SKIP TO QUESTION 38. IF "No," SKIP TO QUESTION 37.

36. Why do you favor a marketing agreement for Florida watermelons?

    a. Could limit supply and get a higher price_____

    b. Could keep low quality melons off the market_____

    c. Would stabilize the industry_____

    d. Would stabilize grades and sizes going to market_____

e. Others (specify)_____

_____

_____

_____

_____

37. Why are you opposed to a marketing agreement on Florida watermelons?

a. Too much governmental interference_____

b. Would not be able to sell all my watermelons_____

c. Would help buyers and hurt growers_____

d. Would make less money on watermelons_____

e. Others (specify)_____

_____

_____

_____

_____

38. What do you think should be done to improve the watermelon marketing situation in Florida?_____

_____

_____

_____

_____

_____

APPENDIX B

Form Used for Survey of Itinerant Truckers

FLORIDA AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURAL ECONOMICS

SURVEY OF INDEPENDENT TRUCKERS HAULING WATERMELONS

Time_____ Date_____

Name of interviewer_____

Name of truck operator_____

Origin of shipment: County_____

Locality in County_____

1. Where is your base of operations? City_____

State_____

2. Where do you usually haul watermelons?

City_____

State_____

3. Is hauling watermelons your regular work during the watermelon season? Yes_____No_____

a. What other products do you haul?_____

_____

_____

_____

_____

4. How many years have you hauled watermelons from Florida?_____

a. How early do you start hauling watermelons?_____

b. Date of first load this year_____

5. Do you haul watermelons from states other than Florida?

Yes_____No_____

a. What states?_____

_____

b. Do you follow the same general method of operation in these other states? Yes_____No_____

1. How does your operation differ?_____

_____

_____

_____

6. How do you determine the price you pay for watermelons?

a. Find out the going price and offer that_____

b. Shop around and get the cheapest melons_____

c. Find the type melons you want and pay what it takes to get them_____

d. Other (specify)_____

_____

_____

7. How do you get watermelon price information?

a. Radio_____

b. Newspaper_____

c. Other truckers_____

d. Brokers_____

e. Growers_____

f. Other (specify)_____

_____

8. How many watermelons do you usually lose from spoilage before selling? None_____Other (specify)_____

_____

9. Where did the transfer of ownership of these watermelons take place?

a. In the field_____

b. Loaded on truck at the field_____

c. Loaded at a central loading point_____

10. How is this load of watermelons being paid for?

a. Cash_____

b. Check_____

c. Open account_____

d. Time_____10 days_____15 days_____30 days____

Other (specify)_____

11. What grade are the watermelons on this load?

a. U.S. No. 1 inspected_____

b. Other inspected grade (specify)_____

c. Field run (ungraded)_____

1. Why do you buy ungraded melons?

   (a) Better buy (cheaper)_____

   (b) No inspection fee to pay_____

   (c) Trouble to get melons inspected_____

   (d) Other (specify)_____

   _____

   _____

d. Cheap melons that can't be shipped graded_____

e. Inspection rejects_____

f. Others (specify)_____

12. What grade of watermelons do you usually haul?

a. U.S. No. 1 inspected_____

b. Other inspected grade (specify)_____

c. Field run (ungraded)_____

d. Cheap melons that can't be shipped graded_____

e. Inspection rejects_____

f. Others (specify)_____

13. What size are the watermelons on this load?

a. Field run_____lbs. to_____lbs.

b. _____lbs. to_____lbs.

14. How many watermelons are to be loaded on this load?

_____

IF ANSWERED BOTH 13 AND 14 THEN SKIP 15.

15. How much does this load of watermelons weigh?_____

16. Are these watermelons being bought on the basis of:

    a. Bulk truck load_____amount_____

    b. Per melon_____amount per melon_____

    c. Weight_____per pound_____

17. For whom are you buying these watermelons?

    a. Yourself_____

    b. A partnership, including yourself_____

    What type of business is your partner in?_____

    c. Someone else:

        1. Independent retailer_____

        2. Chain store_____

        3. Jobber_____

        4. Wholesaler_____

        5. Other (specify)_____

IF ANSWER TO 17 IS "C" THEN SKIP TO QUESTION 20.

18. How will you sell this load of watermelons?

    a. Direct to purchaser_____

        1. Independent retailer_____

        2. Chain store_____

        3. Jobber_____

        4. Wholesaler_____

        5. Direct to consumers_____

b. Through a broker_____

c. Joint account_____

d. Auction_____

e. Other (specify)_____

f. Don't know_____

19. How much will it cost to sell this load of watermelons?

Total load_____Per melon_____

20. How much will it cost to get this load of watermelons to market?_____

21. Where are you going to haul these watermelons?

City_____State_____

22. How long will it be before you unload these watermelons?_____

23. How many loads of watermelons will you haul from Florida this year?_____

24. Have you bought watermelons from this grower before this year?_____How many years?_____

25. How many loads will you buy from this grower this year?_____

26. How did you first get in contact with this grower?

a. Met him at central loading point_____

b. Riding down road and saw his watermelons_____

c. Was referred to him by other truckers_____

d. Through a truck broker_____

1. How much was the broker's fee?_____

e. Through produce broker_____

1. How much was the broker's fee?_____

f. Was referred to him by other growers_____

g. Was referred to him by someone else_____

h. Saw sign advertising watermelons for sale_____

i. Other (specify)_____

27. Do you favor compulsory inspection of Florida watermelons at the shipping point?

a. Favor: Strong_____Moderate_____Weak_____

b. Do not favor: Strong_____Moderate_____Weak_____

c. No opinion_____

IF NO OPINION TO 27 SKIP TO 30 IF NO SKIP TO 29.

28. Why do you favor compulsory inspection?

1. Standardize grades and sizes going to the market__

2. Easier to sell graded watermelons_____

3. Less confusion in the market_____

4. Other (specify)_____

_____

_____

_____

29. Why do you oppose compulsory inspection?

1. Too much governmental interference_____
2. Too much bother_____
3. Cost too much_____
4. Other (specify)_____

_____

_____

_____

30. In your opinion, how could the marketing of watermelons be improved?

a. Cooperative action on part of growers_____
b. Cooperative action on part of buyers_____
c. Compulsory shipping point inspection_____
d. Marketing agreement_____
e. Other (specify)_____

_____

_____

_____

_____

APPENDIX C

Form Used for Survey of Middlemen

FLORIDA AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURAL ECONOMICS

SURVEY OF WATERMELON MIDDLEMEN

Time_____ Date_____

1. Name of interviewer_____
2. Name of interviewee_____
3. Name of firm_____
4. Home office of firm: City_____State_____
5. How do you operate? Own marketing firm_____
   Partnership_____Employee_____
6. a. How many Florida melons will the firm which you represent handle this year?_____carlots
   b. In what other states do you handle watermelons?____
   _____
7. What function do you perform for growers, in addition to selling their melons?
   a. Harvest_____Loading_____Collections_____
   b. Other_____
   _____

8. Of all the Florida watermelons you handled this year, what proportion was handled in the following manner?

Type of sale	Shipping own melons	Shipping for others	Selling broker	Buying broker	Buyer	
					Basis sold	Basis bought
	percent	percent	percent	percent	percent	percent
F.O.B. Cash track						
Other						
Delivered						
Price arrival						
Joint account						
Consigned						
Other						
TOTAL	100	100	100	100	100	100
Percent of all melons						

9. Of the total volume of Florida melons sold by you this year, what proportion was handled in the following manner?

Type of sale	Total sales	Rolling	Chain	Inspected	
				Sold	Bought
	percent	percent	percent	percent	
F.O.B. Cash track		. .			
Other					
Delivered					
Price arrival					
Joint account					
Consigned					
Auction					
Other					
TOTAL	100	100	100	100	100
Inspected				. .	. .
Percent of all sales	. .			. .	. .

10. Of your total sales, what proportion was sold to itinerant truckers? None_____

Other (specify)_____

a. How do you handle this type of transaction?_____

_____

b. What grade of melons do itinerant truckers usually buy? Ungraded_____Inspection rejects_____

U.S. No. 1_____Other (specify)_____

_____

11. a. Do you sell watermelons under a brand name?

Yes_____No_____

b. What portion of your total sales were branded?

_____

12. Do you advertise watermelons under a brand name?

Yes_____No_____

a. What grade (grades) of watermelons do you brand?

U.S. No. 1_____U.S. No. 2_____Other (specify)_____

_____

b. Do you receive a premium price for branded watermelons? Yes_____No_____

1. How much premium?_____

13. What are your charges for selling watermelons?

a. One carload_____

b. Less than one carload_____

c. Multiple carloads_____

14. What are your charges for services other than selling?

a. Harvesting_____per car

b. Loading_____per car

c. Other (specify)_____per car

_____

_____

_____

15. What credit arrangement do you have with growers which require that they market their watermelons through you?

a. None_____

b. Partnership arrangement_____Number of growers____

1. Where you furnish all the cash financing_____

Number of growers_____

2. Where you furnish part of the financing_____

Number of growers_____

c. Contract growing_____Number of growers_____

d. Loans for watermelon production_____

Number of growers_____

e. Others (specify)_____

_____

Number of growers_____

IF ANSWER TO 15 IS "a" SKIP TO 18.

16. Why do you finance watermelon production?

    a. To obtain volume in selling_____

    b. To make money from producing melons_____

    c. Financing friend or relative_____

    d. To obtain high rate of interest on investment_____

    e. Others (specify)_____

    _____

    _____

    _____

17. What is your source of money for financing watermelons?

    a. Own funds_____

    b. Banks or other lending institution_____

        1. Where is it located? Local_____

            Out-of-state_____

    c. Advances from private individuals not in water-

        melon business_____

        1. Where are they located? Local_____

            Out-of-state_____

    d. Advances from individuals or firms involved in

        selling watermelons_____

        1. Chain stores____Local____Out-of-state_____

        2. Wholesalers_____Local____Out-of-state_____

        3. Receivers_____Local____Out-of-state_____

4. Others (specify)_____

_____

_____

18. Would you like to see a state-wide organization formed for the purpose of marketing Florida watermelons?

Yes_____No_____No opinion_____

IF "NO OPINION" SKIP TO QUESTION 22. IF "NO" SKIP TO QUESTION 21.

19. What type of a marketing organization?

a. Cooperative_____

b. Central sales agency_____

c. Other_____

20. Why do you favor a state-wide marketing organization?

a. Easier to deal with than individuals_____

b. More volume from one source_____

c. More uniform product to sell_____

d. Others (specify)_____

_____

_____

_____

_____

21. Why do you oppose a state-wide marketing organization?

a. Hard to deal with_____

b. Would eliminate need for brokers_____

c. Present marketing organization doing good job_____

d. Other reasons (list)_____

_____

_____

_____

_____

22. How do you feel about having compulsory inspection of watermelons at shipping points?

a. Favor: Strong_____Moderate_____Weak_____

b. Do not favor: Strong_____Moderate_____Weak_____

c. No opinion_____

IF "NO OPINION" SKIP TO 25. IF "NO" SKIP TO 24.

23. Why do you favor compulsory inspection?

a. Standardize grades and sizes going to market_____

b. Help control itinerant truckers_____

c. Others (specify)_____

_____

_____

_____

_____

24. Why do you oppose compulsory inspection?

a. Too much governmental interference_____

b. Too much bother_____

c. Cost too much_____

d. Other (specify)_____

_____

_____

_____

_____

25. Would you like to see a marketing agreement on Florida watermelons? Yes_____No_____No opinion_____

IF ANSWER TO 25 IS "NO OPINION" SKIP TO QUESTION 28.

IF "NO" SKIP TO 27.

26. Why do you favor a watermelon marketing agreement?

a. Could keep low-quality watermelons off the market

_____

b. Would stabilize the industry_____

c. Would standardize grades and sizes going to market_____

d. Could control itinerant truckers_____

e. Others (specify)_____

_____

_____

_____

_____

27. Why do you oppose a watermelon marketing agreement?

a. Too much governmental regulation_____

b. Gives monopolistic powers to growers_____

c. Keeps too many melons off the market_____

d. Interferes with the natural marketing process_____

e. Causes too high price to consumer_____

f. Other reasons (list)_____

_____

_____

_____

_____

28. What would you suggest be done in order to improve the marketing of watermelons?

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX D

Form Used for Collection of Watermelon Sales Data

FLORIDA AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF AGRICULTURAL ECONOMICS

WATERMELON SALES DATA

1. Date of sale_____Firm Code_____Record No._____
2. Type of transportation: truck_____rail_____
3. Sold to_____
4. Weight: total_____per melon_____
5. Count_____
6. Type of melon: Grey_____Congo_____other (specify)____
7. Federal inspection: yes_____no_____
8. Grade: U.S. one_____other (specify)_____not indicated_____
9. Branded: yes_____no_____
10. Type of sale: delivered_____f.o.b._____joint_____ other (specify)_____
11. Price: per lb._____per melon_____total_____
12. Freight charge_____commission charge_____
13. Shipped from_____
14. Shipped to: city_____state_____
15. Type of loading (for rail): lengthwise___crosswise___
16. Adjustment: yes_____no_____amount_____
17. Reason for adjustment_____

_____

18. Remarks:_____

_____

_____

_____

APPENDIX E

Short-Run Price Analysis Computations

APPENDIX E

SHORT-RUN PRICE DATA AND COMPUTATIONS, FACTORS AFFECTING THE PRICE OF FLORIDA WATERMELONS, MAY 8 - JULY 10, 1960

Week	Terminal Supplies X_1	Terminal Temperatures X_2	Florida Shipments X_3	Florida Prices Y
May 2 - 8	1.98227	1.82607	1.56820	2.72181
9 - 15	2.30535	1.84510	1.87506	2.66652
16 - 22	2.42775	1.80618	2.27184	2.49969
23 - 29	2.71517	1.88081	2.29667	2.38739
30 - June 5	2.70157	1.88081	2.47129	2.37107
June 6 - 12	2.79379	1.89763	2.63043	2.15534
13 - 19	2.92480	1.88649	2.81291	1.69897
20 - 26	3.10721	1.89763	2.85733	1.50515
27 - July 3	3.22943	1.90309	2.51055	1.34242
July 4 - 10	3.16143	1.91381	2.07555	1.32222
Sum	27.35877	18.73762	23.36983	20.67058
$(\text{Sum})^2$	748.50229	351.09840	546.14895	427.27287
$(\text{Sum})^2/n$	74.85022	35.10984	54.61489	42.72728
Sum of squares	76.29561	35.12136	56.12505	45.43645
Corrected sum of squares	1.44538	0.01152	1.51016	2.70917

Corrected Cross Products

$\Sigma X_1X_2 = 0.11221$ $\Sigma X_2Y = -0.14031$

$\Sigma X_1X_3 = 1.06841$ $\Sigma X_2X_3 = 0.07508$

$\Sigma X_1Y = -1.84525$ $\Sigma X_3Y = -1.15325$

	Terminal Supplies X_1	Terminal Temperatures X_2*	Florida Shipments X_3	Florida Prices Y	Check
X_1	1.44538	1.12210	1.06841	-1.84525	1.79064
X_2	1.12210	1.15100	0.75080	-1.40310	1.62080
X_3	1.06841	0.75080	1.51016	-1.15325	2.17612
A_1	1.44538	1.12210	1.06841	-1.84525	1.79064
B_1	1.00000	0.77633	0.73918	-1.27665	1.23887
A_2		0.27989	-0.07863	0.02942	0.23068
B_2		1.00000	-0.28093	0.10511	0.82418
A_3			0.69834	0.21898	0.91732
B_3			1.00000	0.31357	1.31357

Inverse

c_1	4.15733	-3.15877	-1.37077
c_2	-3.15877	3.68584	0.40228
c_3	-1.37077	0.40228	1.43196

Check

0.99993	0.00005	0.00003
0.00005	0.99998	-0.00001
0.00003	-0.00001	0.99997

$b_1 = -1.65841$ $b_2 = -0.19320$ $b_3 = 0.31357$
(0.44175) (0.41595) (0.25926)

Source of Variation	d.f.	S.S.	M.S.
Regression	3	2.42749	0.80916
Residual	6	0.28168	0.04694
Total	9	2.70917	

$t_1 = -3.75418$ $t_2 = -0.46447$ $t_3 = 1.20948$ $R^2 = 0.896$

---

*X_2 was coded by 10.

	Terminal Supplies X_1	Terminal Temperatures X_2	Florida Prices Y	Check
X_1	1.44538	1.12210	-1.84525	0.72223
X_2	1.12210	1.15200	-1.40310	0.87100
A_1	1.44538	1.12210	-1.84525	0.72223
B_1	1.00000	0.77633	-1.27665	0.49968
A_2		0.28089	0.02942	0.31031
B_2		1.00000	0.10473	1.10473

Inverse

c_1	2.83748	-2.76382
c_2	-2.76382	3.56011

Check

0.99995	0.00002
0.00002	0.99996

$b_1 = -1.35795$ $b_2 = 0.10473$
(0.37683) (0.42210)

Source of Variation	d.f.	S.S.	M.S.
Regression	2	2.35881	1.17940
Residual	7	0.35036	0.05005
Total	9	2.70917	

$t_1 = -3.60361$ $t_2 = 0.24811$ $R^2 = 0.871$

	Terminal Supplies X_1	Florida Shipments X_3	Florida Prices Y	Check
X_1	1.44538	1.06841	-1.84525	0.66854
X_3	1.06841	1.51016	-1.15325	1.42532
A_1	1.44538	1.06841	-1.84525	0.66854
B_1	1.00000	0.73918	-1.27665	0.46253
A_2		0.72041	0.21072	0.93114
B_2		1.00000	0.29250	1.29251

Inverse

c_1	1.45025	-1.02604
c_2	-1.02604	1.38809

Check

0.99993	0.00003
0.00003	1.00000

$b_1 = -1.49286$ $b_2 = 0.29250$
(0.24848) (0.24310)

Source of Variation	d.f.	S.S.	M.S.
Regression	2	2.41737	1.20868
Residual	7	0.29180	0.04258
Total	9	2.70917	

$t_1 = -6.00796$ $t_2 = 1.20320$ $R^2 = 0.892$

	Terminal Supplies X_1	Florida Prices Y	Check
X_1	1.44538	-1.84525	-0.39987
A_1	1.44538	-1.84525	-0.39987
B_1	1.00000	-1.27665	-0.27665

Inverse

c_1 0.69185

Check

0.99998

$b_1 = -1.27665$
(0.17482)

Source of Variation	d.f.	S.S.	M.S.
Regression	1	2.35573	2.35573
Residual	8	0.35344	0.04418
Total	9	2.70917	

$t_1 = -7.30265$ $R^2 = 0.870$

APPENDIX F

Long-Run Price Analysis Computations

APPENDIX F

LONG-RUN PRICE DATA AND COMPUTATIONS OF THE FACTORS AFFECTING THE PRICE OF FLORIDA WATERMELONS, 1951 TO 1960

	Florida Supply X_1	Time X_2	Terminal Temperature X_3
X_1	0.06346	0.07240	-0.00291
X_2	0.07240	0.91211	-0.00745
X_3	-0.00291	-0.00745	0.00064
X_4	0.02133	-0.02933	0.00109
X_5	0.00162	0.03023	-0.00051
A_1	0.06346	0.07240	-0.00291
B_1	1.00000	1.14087	-0.04585
A_2		0.82952	-0.00414
B_2		1.00000	-0.00499
A_3			0.00049
B_3			1.00000
A_4			
B_4			
A_5			
B_5			
			Inverse
c_1	22.69412	-1.31016	97.84276
c_2	-1.31016	1.46041	5.65429
c_3	97.84276	5.65429	2186.91185
c_4	-3.30659	0.18820	20.67197
c_5	6.11352	-6.26892	114.59213

Source of Variation	d.f.
Regression	5
Residual	4
Total	9

	Standard Error of b's
$b_1 = -0.15748$	(0.56570)
$b_2 = -0.04928$	(0.14350)
$b_3 = 18.96930$	(5.55327)
$b_4 = 0.00212$	(0.29434)
$b_5 = -0.17078$	(1.70339)

$R^2 = 0.830$

Other Supply X_4	Disposable Income X_5	Florida Price Y	Check
0.02133	0.00162	-0.06898	0.08692
-0.02933	0.03023	-0.20304	0.77492
0.00109	-0.00051	0.01313	0.00399
0.18125	-0.00486	0.01997	0.18945
-0.00486	0.00608	-0.01257	0.01999
0.02133	0.00162	-0.68980	0.08692
0.33611	0.02552	-1.08698	1.36968
-0.05366	0.02839	-0.12435	0.67576
-0.06468	0.03422	-0.14990	0.81463
0.00180	-0.00030	0.00935	0.01134
3.67346	-0.61224	19.08163	23.14285
0.16401	-0.00247	0.00077	0.16229
1.00000	-0.01506	0.00469	0.98851
	0.00486	-0.00083	0.00404
	1.00000	-0.17078	0.83127
-3.30659	6.11352		
0.18820	-6.26892		
-20.67197	114.59213		
6.14384	3.09876		
3.09876	205.76131		
S.S.	M.S.		
0.27217	0.05443		
0.05643	0.01410		
0.32860			

t Ratio

$t_1 = -0.27838$

$t_2 = -0.34341$

$t_3 = 3.41587$

$t_4 = 0.00720$

$t_5 = -0.10025$

	Florida Supply X_1	Time X_2	Terminal Temperature X_3
X_1	0.06346	0.07240	-0.00291
X_2	0.07240	0.91221	-0.00745
X_3	-0.00291	-0.00745	0.00064
X_5	0.00162	0.03023	-0.00051
A_1	0.06346	0.07240	-0.00291
B_1	1.00000	1.14087	-0.04585
A_2		0.82952	-0.00414
B_2		1.00000	-0.00499
A_3			0.00049
B_3			1.00000
A_4			
A_4			

		Inverse	
c_1	20.91497	-1.20924	86.72419
c_2	-1.20924	1.45494	6.28175
c_3	86.72419	6.28175	2117.47026
c_4	7.79270	-6.37319	125.20244

Source of Variation	d.f.
Regression	4
Residual	5
Total	9

	Standard Error of b's
$b_1 = -0.16026$	(0.48563)
$b_2 = -0.04984$	(0.12808)
$b_3 = 18.87647$	(4.88643)
$b_4 = -0.17177$	(1.51854)

$R^2 = 0.830$

Disposable Income X_5	Florida Price Y	Check
0.00162	-0.06898	0.06559
0.03023	-0.20304	0.80425
-0.00051	0.01313	0.00290
0.00608	-0.01257	0.02485
0.00162	-0.06898	0.06559
0.02552	-1.08698	1.03356
0.02839	-0.12435	0.72943
0.03422	-0.14990	0.87933
-0.00030	0.00935	0.00953
-0.61224	19.08163	19.44897
0.00489	-0.00084	0.00405
1.00000	-0.17177	0.82822

7.79270
-6.37319
125.20244
204.49897

S.S.	M.S.
0.27217	0.06804
0.05643	0.01128
0.32860	

t Ratio

t_1 = -0.33000
t_2 = -0.38913
t_3 = 3.86303
t_4 = -0.11311

	Florida Supply X_1	Time X_2	Terminal Temperature X_3	Florida Price Y	Check
X_1	0.06346	0.07240	-0.00291	-0.06898	0.06397
X_2	0.07240	0.91211	-0.00745	-0.20304	0.77402
X_3	-0.00291	-0.00745	0.00064	0.01313	0.00341
A_1	0.06346	0.07240	-0.00291	-0.06898	0.06397
B_1	1.00000	1.14087	-0.04585	-1.08698	1.00803
A_2		0.82952	-0.00414	-0.12435	0.70104
B_2		1.00000	-0.00499	-0.14990	0.84511
A_3			0.00049	0.00935	0.00983
B_3			1.00000	19.08163	20.06122

Inverse

c_1	20.61800	-0.96637	81.95318
c_2	-0.96637	1.25632	10.18367
c_3	81.95318	10.18367	2,040.81632

Source of Variation	d.f.	S.S.	M.S.
Regression	3	0.27203	0.09067
Residual	6	0.05657	0.00942
Total	9	0.32860	

Standard error of b's t Ratio

$b_1 = -0.14970$ (0.44067) $t_1 = -0.33970$

$b_2 = -0.05469$ (1.12085) $t_2 = -0.50280$

$b_3 = 19.08163$ (4.38247) $t_3 = 4.35229$

$R^2 = 0.830$

	Time X_2	Terminal Temperature X_3	Florida Price Y	Check
X_2	0.91211	-0.00745	-0.20304	0.70162
X_3	-0.00745	0.00064	0.01313	0.00632
A_1	0.91211	-0.00745	-0.20304	0.70162
B1	1.00000	-0.00816	-0.22260	0.76922
A_2		0.00058	0.01147	0.01204
B2		1.00000	19.77586	20.74862
c_1	1.21115	14.06896		
c_2	14.06896	1,724.13793		

Source of Variation	d.f.	S.S.	M.S.
Regression	2	0.27202	0.13601
Residual	7	0.05658	0.00808
Total	9	0.32860	

	Standard Error of b's	t Ratio
$b_1 = -0.06132$	(0.09891)	$t_1 = -0.61904$
$b_2 = 19.77586$	(3.73206)	$t_2 = 5.29891$

$R^2 = 0.830$

	Terminal Temperature X_3	Florida Price Y	Check
X_3	0.00064	0.01313	0.01377
A_1	0.00064	0.01313	0.01377
B_1	1.00000	20.51562	21.51562
c_1	1,562.50000		

Source of Variation	d.f.	S.S.	M.S.
Regression	1	0.26937	0.26937
Residual	8	0.05923	0.00740
Total	9	0.32860	

	Standard Error of b's	t Ratio
$b_1 = 20.51562$	(3.40261)	$t_1 = 6.02937$

$R^2 = 0.820$

	Total Supply X_6	Florida Price Y	Check
X_6	0.05888	-0.03921	0.01967
A_1	0.05888	-0.03921	0.01967
B_1	1.00000	-0.66593	0.33406
c_1	16.98369		

Source of Variation	d.f.	S.S.	M.S.
Regression	1	0.02611	0.02611
Residual	8	0.30249	0.03781
Total	9	0.32860	

	Standard Error of b's	t Ratio
$b_1 = -0.66593$	(0.80131)	$t_1 = -0.83105$

$R^2 = 0.08$

$(\Sigma x_1)(\Sigma x_2) = 235.69545$
$\Sigma x_1 x_2 = 23.64194$
$\Sigma x_1 x_2 = \underline{+0.07240}$
$(\Sigma x_1)(\Sigma x_3) = 677.45376$
$\Sigma x_1 x_3 = 67.74246$
$\Sigma x_1 x_3 = \underline{-0.00291}$
$(\Sigma x_1)(\Sigma x_4) = 1,199.36763$
$\Sigma x_1 x_4 = 119.95809$
$\Sigma x_1 x_4 = \underline{+0.02133}$
$(\Sigma x_1)(\Sigma x_5) = 1,133.03957$
$\Sigma x_1 x_5 = 113.30557$
$\Sigma x_1 x_5 = \underline{+0.00162}$
$(\Sigma x_1)(\Sigma Y) = 717.06139$
$\Sigma x_1 Y = 71.63715$
$\Sigma x_1 y = \underline{-0.06898}$

$(\Sigma x_2)(\Sigma x_3) = 123.68138$
$\Sigma x_2 x_3 = 12.36068$
$\Sigma x_2 x_3 = \underline{-0.00745}$
$(\Sigma x_2)(\Sigma x_4) = 218.96616$
$\Sigma x_2 x_4 = 21.86728$
$\Sigma x_2 x_4 = \underline{-0.02933}$
$(\Sigma x_2)(\Sigma x_5) = 206.85678$
$\Sigma x_2 x_5 = 20.71590$
$\Sigma x_2 x_5 = \underline{+0.03023}$
$(\Sigma x_2)(\Sigma Y) = 130.91247$
$\Sigma x_2 Y = 12.88820$
$\Sigma x_2 y = \underline{-0.20304}$

$(\Sigma x_3)(\Sigma x_4) = 629.36917$
$\Sigma x_3 x_4 = 62.93800$
$\Sigma x_3 x_4 = \underline{+0.00109}$
$(\Sigma x_3)(\Sigma x_5) = 594.56346$
$\Sigma x_3 x_5 = 59.45583$
$\Sigma x_3 x_5 = \underline{-0.00051}$
$(\Sigma x_3)(\Sigma Y) = 376.27856$
$\Sigma x_3 Y = 37.64098$
$\Sigma x_3 y = \underline{+0.01313}$

$(\Sigma x_4)(\Sigma x_5) = 1,052.61821$
$\Sigma x_4 x_5 = 105.25696$
$\Sigma x_4 x_5 = \underline{-0.00486}$
$(\Sigma x_4)(\Sigma Y) = 666.16551$
$\Sigma x_4 Y = 66.63652$
$\Sigma x_4 y = \underline{+0.01997}$

$(\Sigma x_5)(\Sigma Y) = 629.32487$
$\Sigma x_5 Y = 62.91991$
$\Sigma x_5 y = \underline{-0.01257}$

Year	Florida Supply X_1	Time X_2
1951	3.46776	0.00000
1952	3.54568	0.30103
1953	3.63819	0.47712
1954	3.66717	0.60206
1955	3.64256	0.69897
1956	3.68993	0.77815
1957	3.57898	0.84510
1958	3.65031	0.90309
1959	3.44311	0.95424
1960	3.60681	1.00000
ΣX_i	35.93050	6.55976
$(\Sigma X_i)^2$	1,291.00083	43.03045
$(\Sigma X_i)^2/n$	129.10008	4.30304
ΣX_i^2	129.16354	5.21515
$\Sigma X_i^2 - (\Sigma X_i)^2/n$	0.06346	0.91211

Terminal Temperature X_3	Other Supply X_4	Disposable Income X_5	Florida Price Y
1.88536	3.31091	3.11826	2.06819
1.89265	3.23376	3.11793	2.16435
1.89597	3.37199	3.13577	2.07188
1.87852	3.60670	3.13418	1.84510
1.88705	3.49610	3.15473	2.11727
1.88536	3.34025	3.16613	2.03342
1.88649	3.13418	3.16673	2.11059
1.87157	3.18412	3.16435	1.60206
1.89653	3.40466	3.18355	2.17319
1.87506	3.29754	3.19257	1.77085
18.85456	33.38021	31.53420	19.95690
355.49443	1,114.23841	994.40576	398.27785
35.54944	111.42384	99.44057	39.82778
35.55008	111.60509	99.44665	40.15638
0.00064	0.18125	0.00608	0.32860

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BIOGRAPHICAL SKETCH

Elmer George Close was born January 15, 1924, in Glades County, Florida. He attended the public schools there and was graduated from Moore Haven High School in June, 1941. After serving in the Army Air Corps from January, 1943, until November, 1945, he entered the University of Florida and received his Bachelor of Science in Agriculture, with honors, in June, 1948.

After farming two years he entered the University of Florida Graduate School where he was granted his Master of Science in Agriculture in February, 1952. From June, 1950, to February, 1952, he held the position of Teaching Assistant in Agricultural Economics.

From February, 1952, until September, 1958, he worked in business, agriculture, and teaching. In September, 1958, he re-entered the University of Florida Graduate School where he will receive his Doctor of Philosophy in Agricultural Economics in December, 1962. From September, 1958, until September, 1961, he held the position of Research Assistant with the Florida Agricultural Experiment Station. From September, 1961, until his graduation, he

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He is a member of Alpha Gamma Rho social fraternity, Alpha Zeta honorary agricultural fraternity, and Gamma Sigma Delta agricultural honor society.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Agriculture and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1962

M. A. Brooks
Dean, College of Agriculture

Dean, Graduate School

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